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Service Manual

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PHILIPS

1. Technical Specifications, Connections, and Chassis Overview

Index of this chapter:

1.1 Technical Specifications
1.2 Connection Overview
1.3 Chassis Overview

Notes:

- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

1.1 Technical Specifications

1.1.1 Vision

Display type	:	LCD
Screen size	:	32” (82 cm), 16:9
	:	42” (107 cm), 16:9
Resolution (HxV pixels)	:	1366 x 768
Min. contrast ratio	:	4000:1 (32”)
	:	5000:1 (42”)
Min. light output (cd/m^2)	:	500
Typ. response time (ms)	:	8 (32”)
	:	5 (42”)
Viewing angle (HxV degrees)	:	178x178
Tuning system	:	PLL
TV Colour systems	:	PAL B/G, D/K, I
	:	SECAM B/G, D/K, L/L’
Video playback	:	NTSC
	:	PAL
	:	SECAM
Supported computer formats	:	WXGA (1366x768)
Supported video formats	:	640x480i - 1fH
	:	720x576i - 1fH
	:	640x480p - 2fH
	:	720x576p - 2fH
	:	1920x1080i - 2fH
	:	1280x720p - 3fH
Presets/channels	:	100 presets
Tuner bands	:	VHF
	:	UHF
	:	S-band
	:	Hyper-band

1.1.2 Sound

Sound systems	:	NICAM D/K, I, L/L’
	:	2CS D/K, B/G
Equalizer	:	7-bands
Maximum power (W_{RMS})	:	2 x 10

1.1.3 Miscellaneous

Power supply:		
- Mains voltage (V_{AC})	:	220 - 240
- Mains frequency (Hz)	:	50 / 60
Ambient conditions:		
- Temperature range (°C)	:	+5 to +40
- Maximum humidity	:	90% R.H.
Power consumption (values are indicative)		
- Normal operation (W)	:	≈ 140 (32”)
	:	≈ 240 (42”)
- Stand-by (W)	:	< 1
Dimensions (WxHxD cm)	:	80.5x54.6x11.5 (32”)
	:	104.5x68.6x11.6 (42”)
Weight (kg)	:	15.5 (32”)
	:	25 (42”)

1.2 Connection Overview

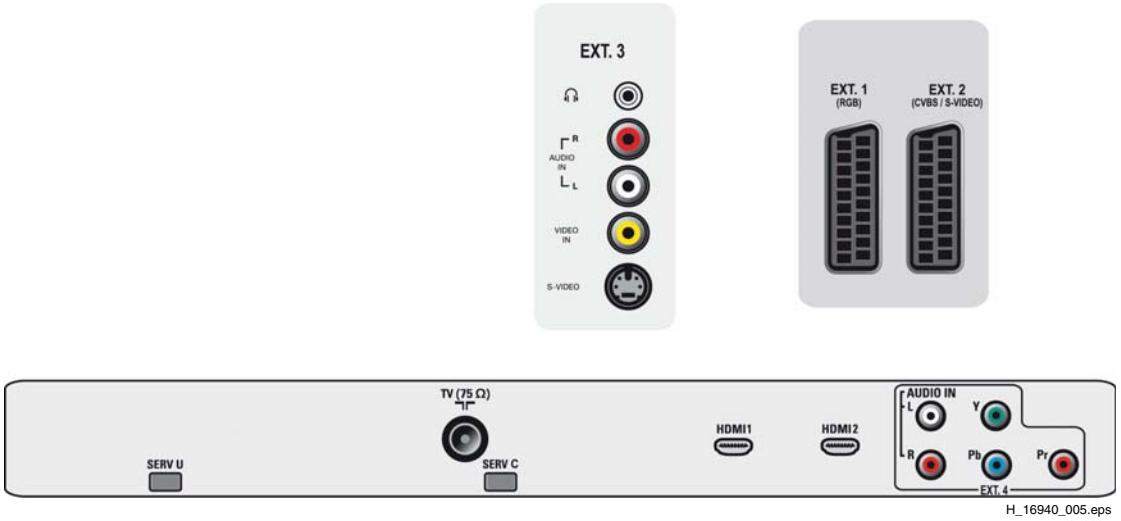

Figure 1-1 Side and rear I/O connections

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, and Ye= Yellow.

1.2.1 Side Connections

EXT3: Headphone - Out

Bk - Headphone	32 - 600 ohm / 10 mW	

EXT3: Cinch: Video CVBS - In, Audio - In

Rd - Audio R	0.5 V_{RMS} / 10 kohm	
Wh - Audio L	0.5 V_{RMS} / 10 kohm	
Ye - Video CVBS	1 V_{PP} / 75 ohm	

EXT3: S-Video (Hosiden): Video Y/C - In

1 - Ground Y	Gnd	
2 - Ground C	Gnd	
3 - Video Y	1 V_{PP} / 75 ohm	
4 - Video C	0.3 V_{PP}P / 75 ohm	

1.2.2 Rear Connections

EXT1: Video RGB - In, CVBS - In/Out, Audio - In/Out

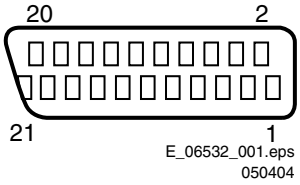

Figure 1-2 SCART connector

1 - Audio R	0.5 V_{RMS} / 1 kohm	
2 - Audio R	0.5 V_{RMS} / 10 kohm	
3 - Audio L	0.5 V_{RMS} / 1 kohm	
4 - Ground Audio	Gnd	
5 - Ground Blue	Gnd	
6 - Audio L	0.5 V_{RMS} / 10 kohm	
7 - Video Blue	0.7 V_{PP} / 75 ohm	
8 - Function Select	0 - 2 V: INT	
	4.5 - 7 V: EXT 16:9	
	9.5 - 12 V: EXT 4:3	
9 - Ground Green	Gnd	
10 - Easylink P50	0 - 5 V / 4.7 kohm	
11 - Video Green	0.7 V_{PP} / 75 ohm	
12 - n.c.		
13 - Ground Red	Gnd	
14 - Ground P50	Gnd	
15 - Video Red	0.7 V_{PP} / 75 ohm	
16 - Status/FBL	0 - 0.4 V: INT	
	1 - 3 V: EXT / 75 ohm	
17 - Ground Video	Gnd	
18 - Ground FBL	Gnd	
19 - Video CVBS	1 V_{PP} / 75 ohm	
20 - Video CVBS	1 V_{PP} / 75 ohm	
21 - Shield	Gnd	

EXT2: Video YC - In, CVBS - In/Out, Audio - In/Out

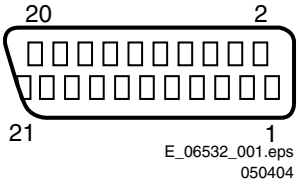

Figure 1-3 SCART connector

1 - Audio R	0.5 V_{RMS} / 1 kohm	
2 - Audio R	0.5 V_{RMS} / 10 kohm	
3 - Audio L	0.5 V_{RMS} / 1 kohm	
4 - Ground Audio	Gnd	
5 - n.c.		
6 - Audio L	0.5 V_{RMS} / 10 kohm	
7 - C-out	0.7 V_{PP} / 75 ohm	
8 - Function Select	0 - 2 V: INT	
	4.5 - 7 V: EXT 16:9	
	9.5 - 12 V: EXT 4:3	
9 - n.c.		
10 - Easylink P50	0 - 5 V / 4.7 kohm	
11 - n.c.		
12 - n.c.		
13 - n.c.		
14 - Ground P50	Gnd	
15 - C	0.7 V_{PP} / 75 ohm	
16 - Status/FBL	0 - 0.4 V: INT	
	1 - 3 V: EXT / 75 ohm	
17 - Ground Video	Gnd	

18	- Ground FBL	Gnd	
19	- Video CVBS	1 V_{PP} / 75 ohm	
20	- Video CVBS/Y	1 V_{PP} / 75 ohm	
21	- Shield	Gnd	

Service Connector (UART)

1	- UART_TX	Transmit	
2	- Ground	Gnd	
3	- UART_RX	Receive	

Aerial - In

-	- IEC-type (EU)	Coax, 75 ohm	

Service Connector (ComPair)

1	- SDA-S	I^2C Data (0 - 5 V)	
2	- SCL-S	I^2C Clock (0 - 5 V)	
3	- Ground	Gnd	

HDMI 1 & 2: Digital Video, Digital Audio - In

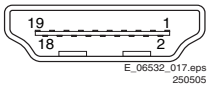

Figure 1-4 HDMI (type A) connector

1	- D2+	Data channel	
2	- Shield	Gnd	
3	- D2-	Data channel	
4	- D1+	Data channel	
5	- Shield	Gnd	
6	- D1-	Data channel	
7	- D0+	Data channel	
8	- Shield	Gnd	
9	- D0-	Data channel	
10	- CLK+	Data channel	
11	- Shield	Gnd	
12	- CLK-	Data channel	
13	- n.c.		
14	- n.c.		
15	- DDC_SCL	DDC clock	
16	- DDC_SDA	DDC data	
17	- Ground	Gnd	
18	- +5V		
19	- HPD	Hot Plug Detect	
20	- Ground	Gnd	

EXT4: Cinch: Video YPbPr - In, Audio - In

Gn	- Video Y	1 V_{PP} / 75 ohm	
Bu	- Video Pb	0.7 V_{PP} / 75 ohm	
Rd	- Video Pr	0.7 V_{PP} / 75 ohm	
Wh	- Audio L	0.5 V_{RMS} / 10 kohm	
Rd	- Audio R	0.5 V_{RMS} / 10 kohm	

1.3 Chassis Overview

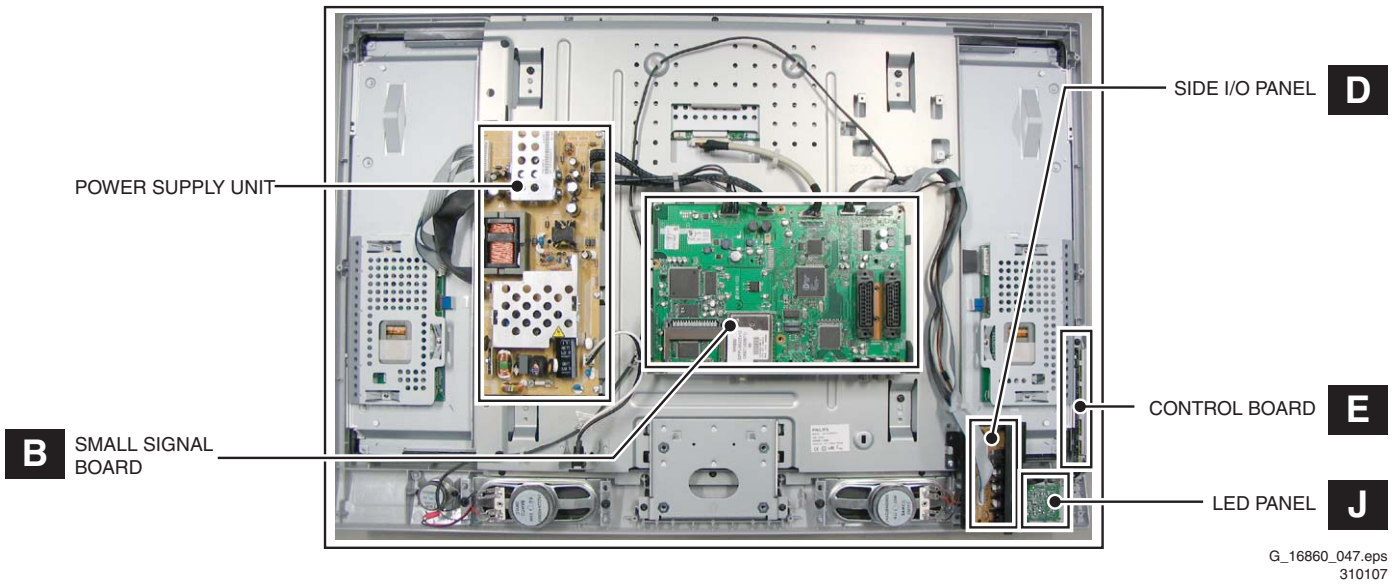

Figure 1-5 PWB/CBA locations (32” models)

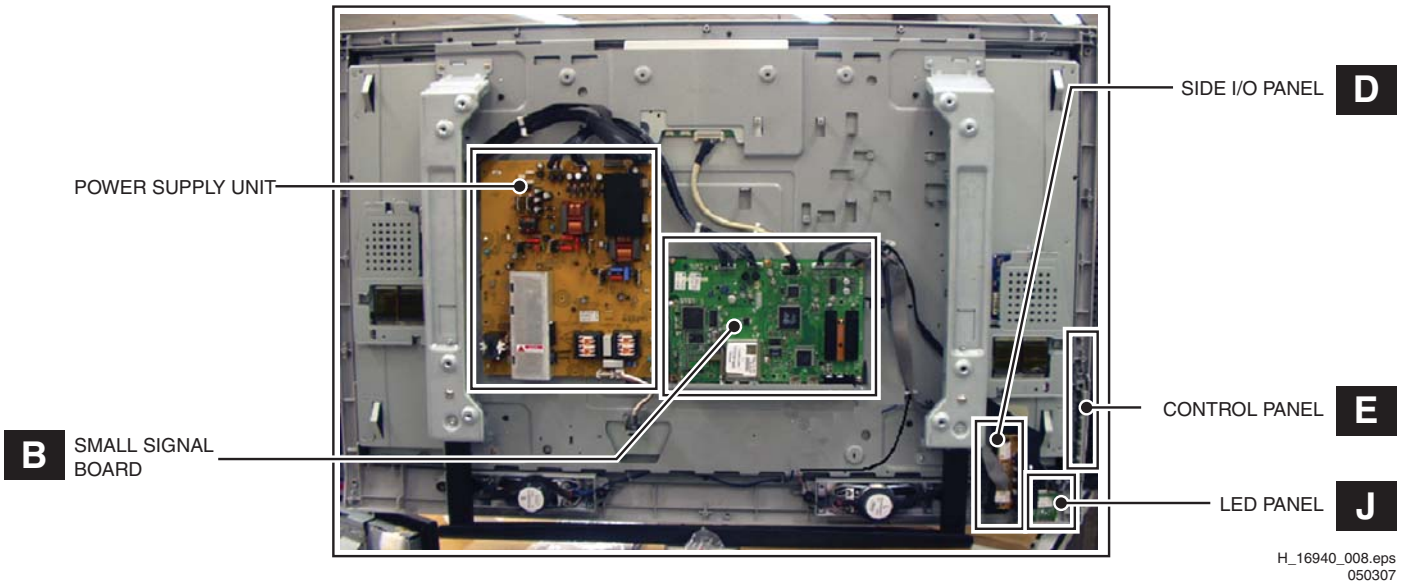

Figure 1-6 PWB/CBA locations (42" models)

2. Safety Instructions, Warnings, and Notes

Index of this chapter:

2.1 Safety Instructions
2.2 Warnings
2.3 Notes

2.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
  1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
  2. Set the Mains/AC Power switch to the "on" position (keep the Mains/AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 Mohm and 12 Mohm.
  4. Switch "off" the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential. Available ESD protection equipment:
  – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
  – Wristband tester 4822 344 13999.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched "on".
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

2.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5) with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⊓⊓) and without (⊼⊼) aerial signal. Measure the voltages in the power supply section both in normal operation (⏻) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.
- Manufactured under license from Dolby Laboratories. “Dolby”, “Pro Logic” and the “double-D symbol”, are trademarks of Dolby Laboratories.

2.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kohm).
- Resistor values with no multiplier may be indicated with either an "E" or an "R" (e.g. 220E or 220R indicates 220 ohm).
- All capacitor values are given in micro-farads (μ= x10^{-6}), nano-farads (n= x10^{-9}), or pico-farads (p= x10^{-12}).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An "asterisk" (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed in the Spare Parts List. Therefore, always check this list when there is any doubt.

2.3.3 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: *www.atyourservice.ce.philips.com* (needs subscription, not available for all regions). After login, select “Magazine”, then go to “Repair downloads”. Here you will find Information on how to deal with BGA-ICs.

BGA Temperature Profiles

For BGA-ICs, you **must** use the correct temperature-profile, which is coupled to the 12NC. For an overview of these profiles, visit the website *www.atyourservice.ce.philips.com* (needs subscription, but is not available for all regions)
You will find this and more technical information within the "Magazine", chapter "Repair downloads".
For additional questions please contact your local repair help desk.

2.3.4 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin Philips SAC305 with order code 0622 149 00106. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  – To reach a solder-tip temperature of at least 400°C.
  – To stabilize the adjusted temperature at the solder-tip.
  – To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed.

To avoid wear-out of tips, switch “off” unused equipment or reduce heat.

- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

2.3.5 Alternative BOM identification

The **third digit** in the serial number (example: AG**2**B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.
By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number “1” (example: AG**1**B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a “2” (example: AG**2**B0335000001), then the set has been produced according to B.O.M. no. 2. ***This is important for ordering the correct spare parts!***
For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26= 35 different B.O.M.s can be indicated by the third digit of the serial number.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production center (e.g. AG is Bruges), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2006 week 17). The 6 last digits contain the serial number.

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Figure 2-1 Serial number (example)

2.3.6 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.
If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

2.3.7 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages**. While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3. Directions for Use

You can download this information from the following websites:
http://www.philips.com/support
http://www.p4c.philips.com

4. Mechanical Instructions

Index of this chapter:

4.1 Cable Dressing
4.2 Service Positions
4.3 Assy/Panel Removal
4.4 Set Re-assembly

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.
- Follow the disassemble instructions in described order. They apply to the 32” sets.

4.1 Cable Dressing

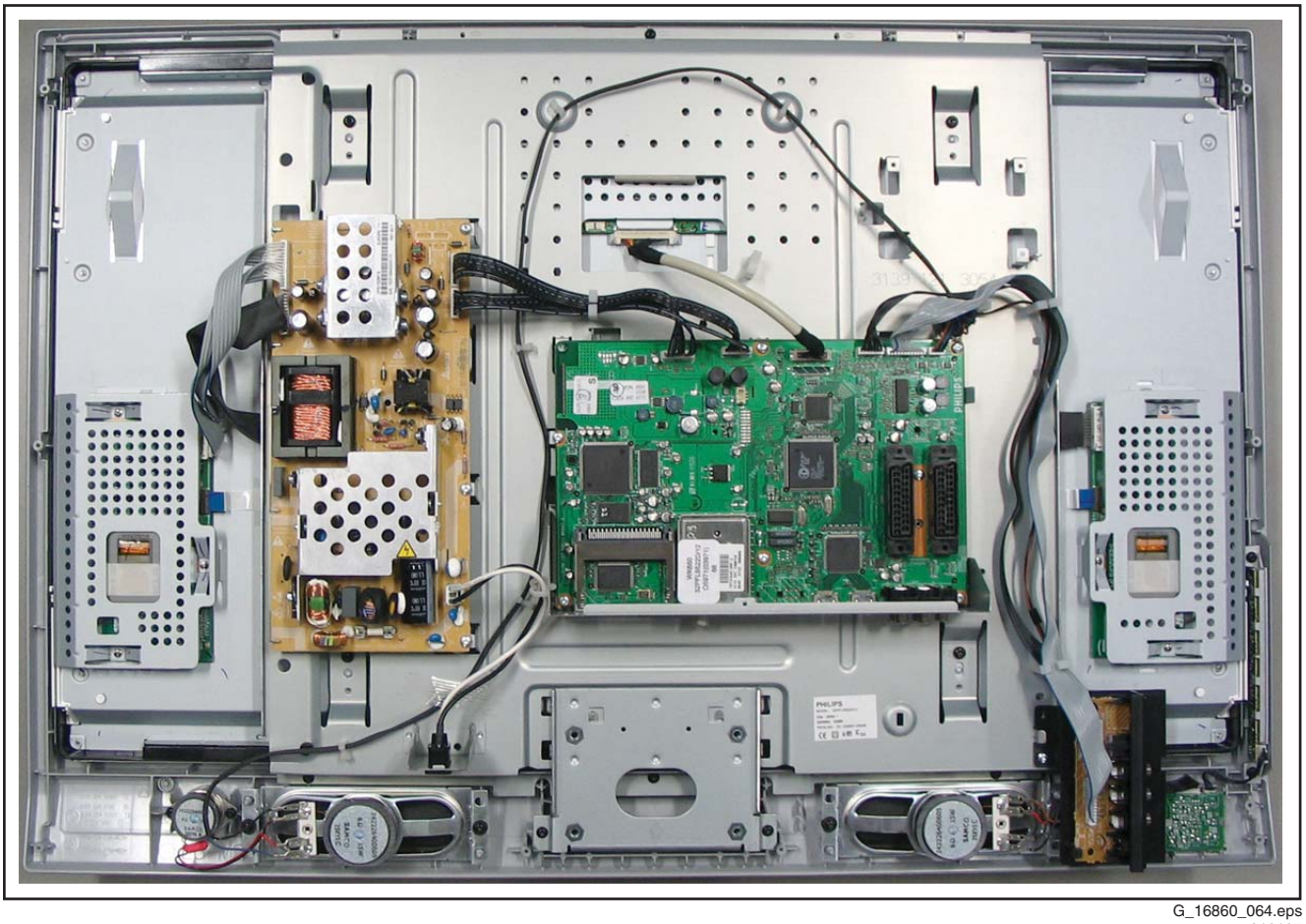

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Figure 4-1 Cable dressing (32” models)

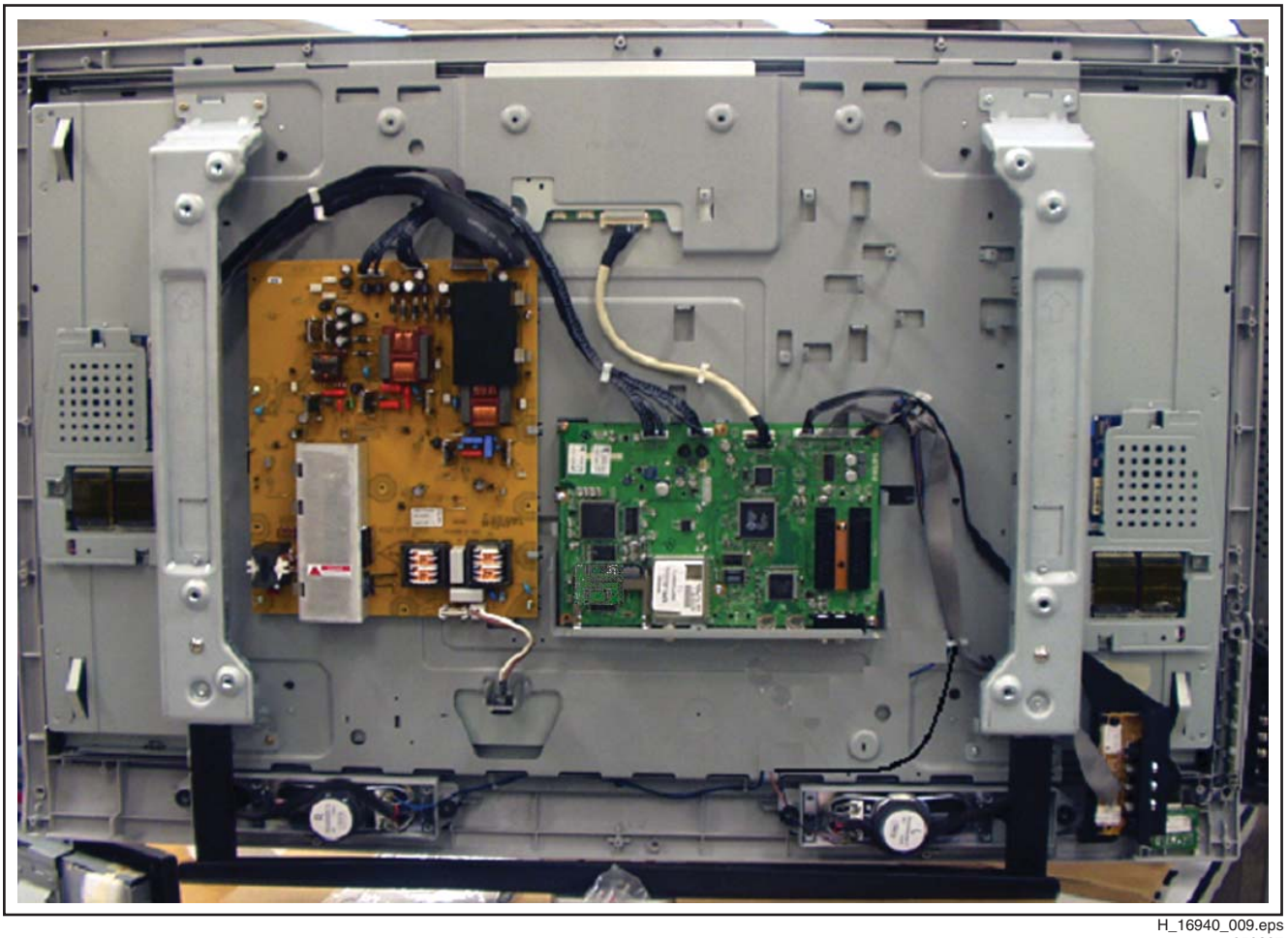

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Figure 4-2 Cable dressing (42” models)

4.2 Service Positions

For easy servicing of this set, there are a few possibilities created:
- The buffers from the packaging.
- Foam bars (created for Service).
- Aluminium service stands (created for Service).

Note: the aluminium service stands can only be used when the set is equipped with so-called “mushrooms”. Otherwise use the original stand that comes with the set.

4.2.1 Foam Bars

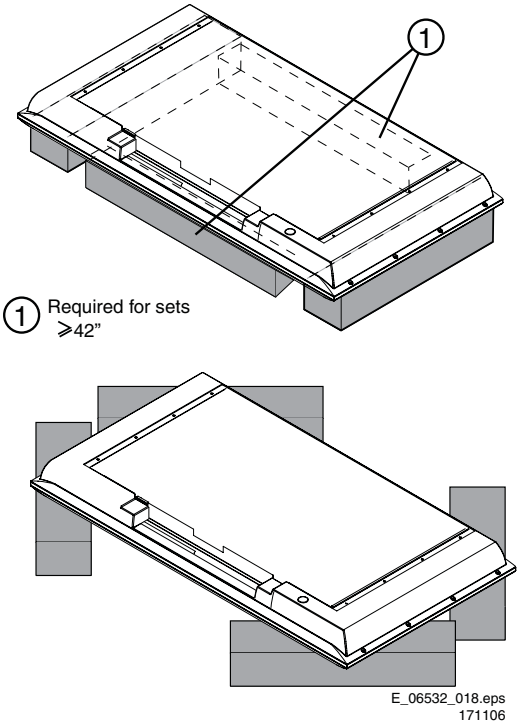

Figure 4-3 Foam bars

The foam bars (order code 3122 785 90580 for two pieces) can be used for all types and sizes of Flat TVs. See figure “Foam bars” for details. Sets with a display of 42” and larger, require **four** foam bars [1]. Ensure that the foam bars are always supporting the cabinet and **never** only the display. **Caution:** Failure to follow these guidelines can seriously damage the display!
By laying the TV face down on the (ESD protective) foam bars, a stable situation is created to perform measurements and alignments. By placing a mirror under the TV, you can monitor the screen.

4.2.2 Aluminium Stands

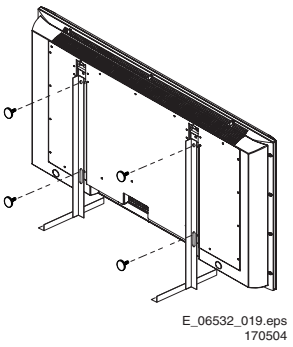

Figure 4-4 Aluminium stands (drawing of MkI)

The new MkII aluminium stands (not on drawing) with order code 3122 785 90690, can also be used to do measurements, alignments, and duration tests. The stands can be (dis)mounted quick and easy by means of sliding them in/out the "mushrooms". The new stands are backwards compatible with the earlier models.
Important: For (older) FTV sets without these "mushrooms", it is obligatory to use the provided screws, otherwise it is possible to damage the monitor inside!

4.3 Assy/Panel Removal

4.3.1 Rear Cover

Warning: Disconnect the mains power cord before you remove the rear cover.

1. Place the TV set upside down on a table top, using the foam bars (see part "Service Position").
2. Remove rear cover screws and the stand (if mounted).
3. Remove rear cover.

4.3.2 Keyboard Control Panel

1. Remove the rear cover, as described earlier.
2. Refer to fig. “Keyboard control panel“ below.
3. Remove the T10 parker screws [1].
4. Unplug connector [2].
5. Remove the unit.
6. Release clips [3] and remove the board.

When defective, replace the whole unit.

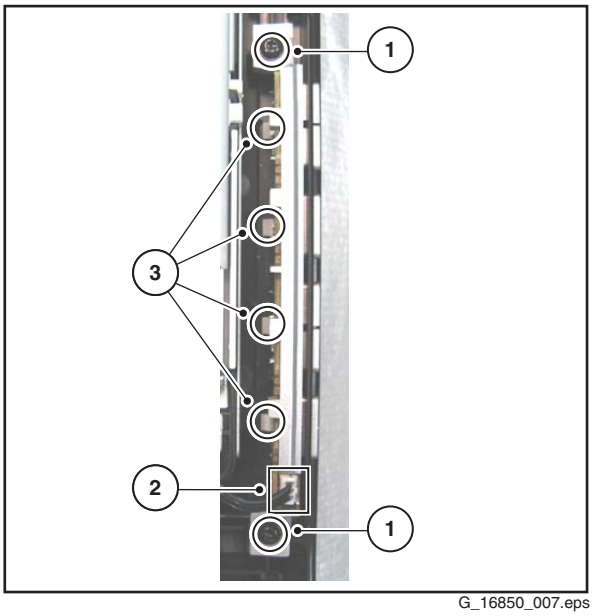

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Figure 4-5 Keyboard control panel

4.3.3 Side I/O Panel

1. Remove the rear cover, as described earlier.
2. Unplug connector [a].
3. Remove screws [b] and remove the complete module. One of the screws is T10 tapping, the other one is T10 parker. See fig. “Side I/O module”.
4. Remove T10 parker screw [c]. See fig. “Side I/O panel 1”.
5. Push catch [d] (located at the underside of the bracket) and slide the unit to the right from its bracket [e]. See fig. “Side I/O panel 2”.
6. To remove the PWB from its bracket, you have to lift the catch [f] loacted on top of the headphone connector. At the same time, slide the PWB out of its bracket [g]. See fig. “Side I/O panel 3”.

When defective, replace the whole unit.

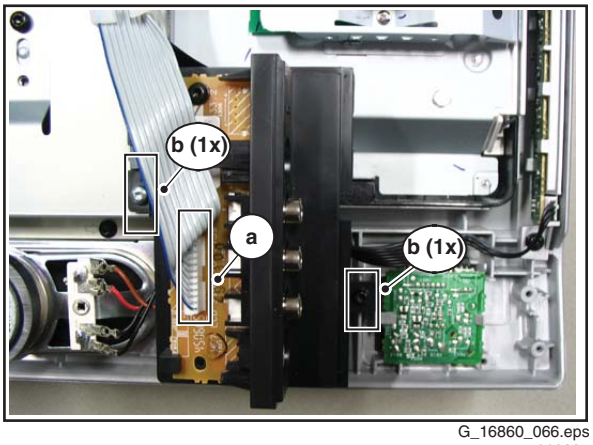

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Figure 4-6 Side I/O module

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Figure 4-7 Side I/O panel [1/3] top side

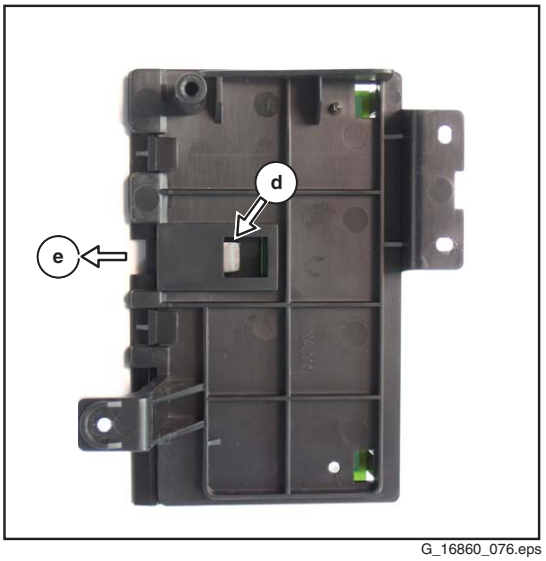

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Figure 4-8 Side I/O panel [2/3] bottom side

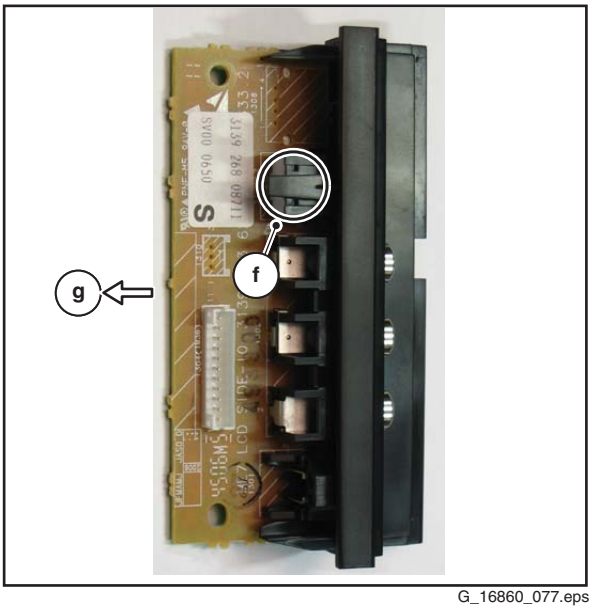

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Figure 4-9 Side I/O panel [3/3]

4.3.4 IR/LED Panel

1. Remove the rear cover, as described earlier.
2. Refer to fig. “IR/LED panel“ below.
3. Unplug connector(s) [1].
4. Release clip [2] and remove the board.

When defective, replace the whole unit.

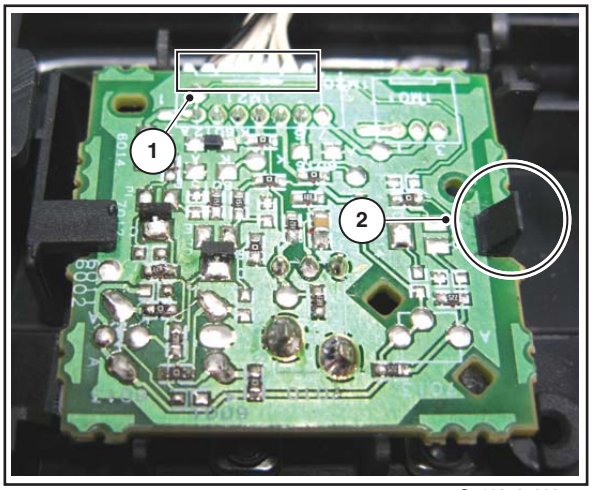

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Figure 4-10 IR/LED panel

4.3.5 Mid-range Speakers

1. Remove the rear cover, as described earlier.
2. Refer to fig. “Mid-range speakers“ below.
3. Unplug connectors [1].
4. Remove T10 parker screws [2].

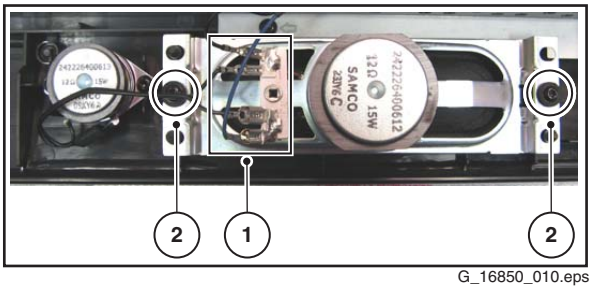

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Figure 4-11 Mid-range speakers

4.3.6 Tweeters

1. Remove the rear cover, as described earlier.
2. Refer to fig. “Tweeters” below.
3. Unplug connectors [1].
4. Remove T10 parker screws [2].

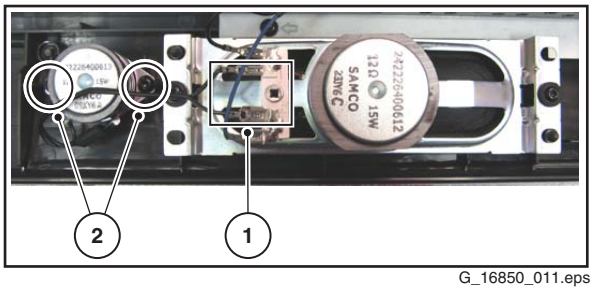

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Figure 4-12 Tweeters

4.3.7 Small Signal Board (SSB)

1. Remove the rear cover, as described earlier.
2. Refer to fig. “SSB removal“ below.
3. Disconnect all cables [a] on the SSB.
4. Remove the T10 tapping screws [b] that hold the SSB. See Figure “SSB removal”.
5. Remove the screws that hold the CINCH and HDMI connectors at the connector panel.
6. Lift the SSB from the set.

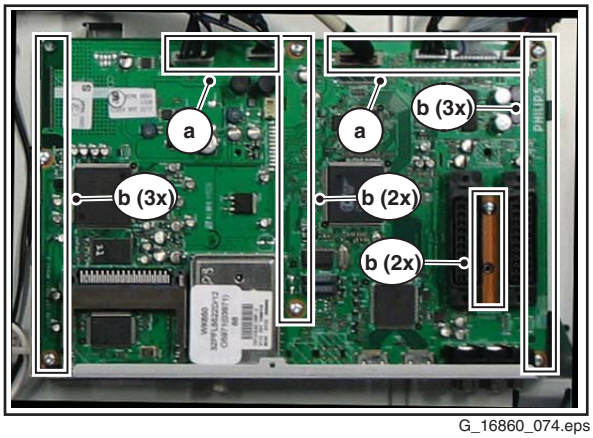

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Figure 4-13 SSB removal

4.3.8 Main Supply Panel

1. Remove the rear cover, as described earlier.
2. Refer to fig. “Main supply panel“ below.
3. Unplug cables [a].
4. Remove the fixation screws [b].
5. Take the board out (it hinges at the left side).

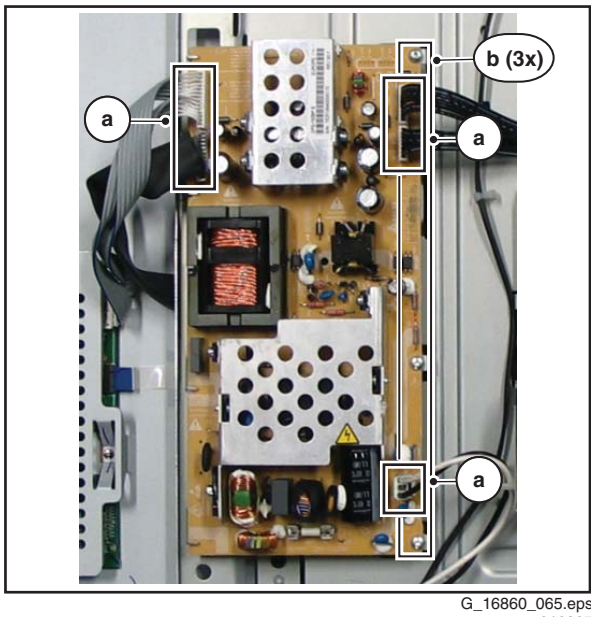

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Figure 4-14 Main supply panel

4.3.9 LCD Panel

1. Remove the rear cover, as described earlier.
2. Refer to fig. “LCD panel“ below.
3. Unplug the connectors on the Main Supply Panel [a] and the LED & IR board [c].
4. Unplug the outer connectors [d] from the mid-range loudspeakers.
5. **Do NOT forget** to unplug the LVDS connector [e] from the SSB. **Important:** Be careful, as this is a very fragile connector!
6. Remove T10 parker screw [b] that holds the Side I/O module bracket.
7. Remove T10 parker screws [f] of the central sub-frame.
8. Remove LCD panel fixation screws [g] and lift the complete central sub-frame from the set (incl. the PSU, SSB, and Side I/O boards and wiring).
9. Lift the LCD panel [7] from the front cabinet.

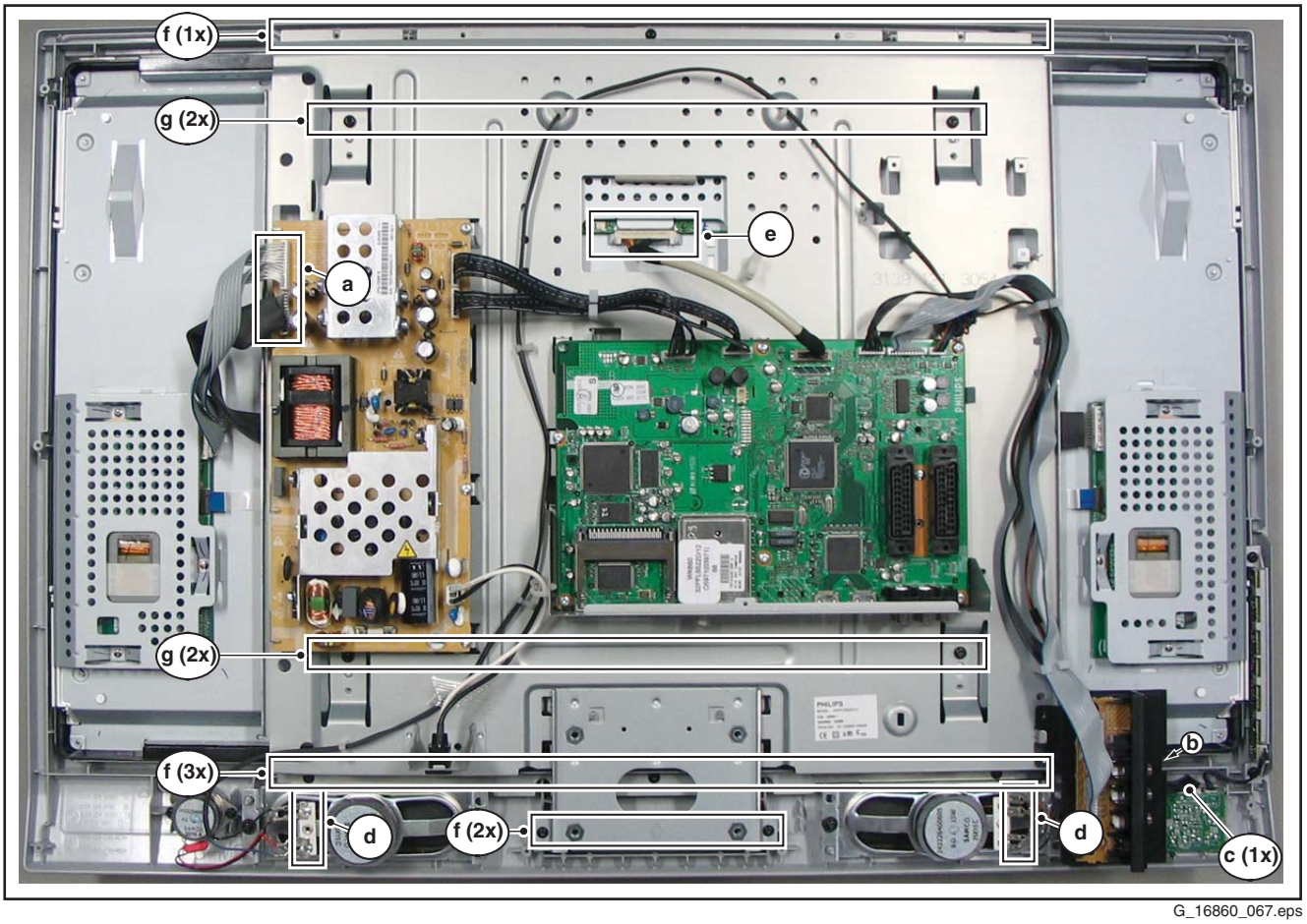

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Figure 4-15 LCD panel [1/2]

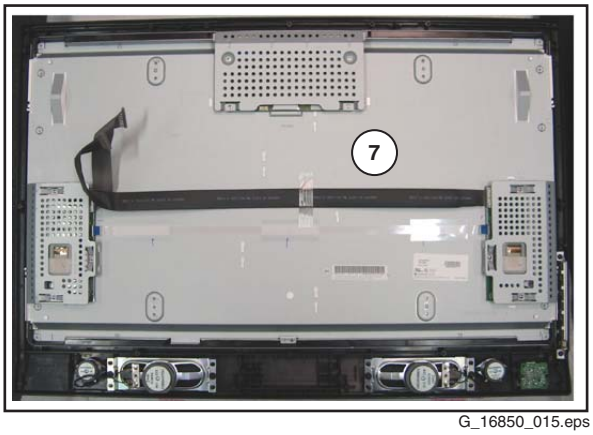

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Figure 4-16 LCD panel [2/2]

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position. See figure "Cable dressing".
- Pay special attention not to damage the EMC foams. Ensure that EMC foams are mounted correctly (one is located above the LVDS connector on the display, between the LCD display and the metal sub-frame).

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

5.1 Test Points
5.2 Service Modes
5.3 Service Tools
5.4 Error Codes
5.5 The Blinking LED Procedure
5.7 Fault Finding and Repair Tips

5.1 Test Points

In the chassis schematics and layout overviews, the test points (Fxxx) are mentioned. In the schematics, test points are indicated with a rectangular box around “Fxxx” or “Ixxx”, in the layout overviews with a “half-moon” sign.
As most signals are digital, it will be difficult to measure waveforms with a standard oscilloscope. Several key ICs are capable of generating test patterns, which can be controlled via ComPair. In this way it is possible to determine which part is defective.

Perform measurements under the following conditions:
- Service Default Mode.
- Video: Colour bar signal.
- Audio: 3 kHz left, 1 kHz right.

5.2 Service Modes

The Service Mode feature is split into four parts:
- Service Default Mode (SDM).
- Service Alignment Mode (SAM).
- Customer Service Mode (CSM) and Digital Customer Service Mode (DCSM).
- Computer Aided Repair Mode (ComPair).

SDM and SAM offer features, which can be used by the Service engineer to repair/align a TV set. Some features are:
- A pre-defined situation to ensure measurements can be made under uniform conditions (SDM).
- Activates the blinking LED procedure for error identification when no picture is available (SDM).
- The possibility to overrule software protections when SDM was entered via the Service pins.
- Make alignments (e.g. white tone), (de)select options, enter options codes, reset the error buffer (SAM).
- Display information (“SDM” or “SAM” indication in upper right corner of screen, error buffer, software version, operating hours, options and option codes, submenus).

The (D)CSM is a Service Mode that can be enabled by the consumer. Instructions on how to enable the CSM can be given by telephone by either the dealer or the P3C (Philips Customer Care Center). The CSM displays diagnosis information, which the customer can forward to the dealer/P3C. In CSM mode, “CSM”, is displayed in the top right corner of the screen.

The information provided in CSM and the purpose of CSM is to:
- Increase the home repair hit rate
- Decrease the number of nuisance calls
- Solved customers' problem without home visit

ComPair Mode is used for communication between a computer and a TV on I2C /UART level and can be used by a Service engineer to quickly diagnose the TV set by reading out error codes, read and write in NVMs, communicate with ICs and the uP (PWM, registers, etc.), and by making use of a faultfinding database. It will also be possible to up and download the software of the TV set via I2C with help of ComPair. To do this, ComPair has to be connected to the TV set via the ComPair connector, which will be accessible through the rear of the set (without removing the rear cover).

5.2.1 General

Some items are applicable to all Service Modes or are general. These are listed below.

Life Timer
During the life time cycle of the TV set, a life timer is kept. This life timer counts the normal operation hours, but not the Stand-by hours. The actual value of the life timer is displayed in SDM and CSM in a decimal value. Every two soft-resets should increase the hour by +1. Minimal five digits are displayed.

Software Identification, Version, and Cluster
The software identification, version, and cluster will be shown in the main menu display of SDM, SAM, and CSM.
The screen will show: “**AAAABCD X.YY**”, where:
- **AAAA** is the chassis name: LC71 for analogue range (non-DVB), LC72 for digital range (DVB).
- **B** is the region indication: E= Europe, A= AP/China, U= NAFTA, L= LATAM.
- **C** is the display indication: L= LCD, P= Plasma.
- **D** is the language/features indication: 1= standard, H= 1080p full HD.
- **X** is the main version number: The main version number is updated with a major change of specification (incompatible with the previous software version). Numbering will go from 1 - 9 then from A - Z.
  - If the main version number changes, the new version number is written in the NVM
  - If the main version number changes, the default settings are loaded
- **YY** is the sub version number: The sub version number is updated with a minor change (backwards compatible with the previous versions) Numbering will go from 00 - 99.
  - If the sub version number changes, the new version number is written in the NVM
  - If the NVM is fresh, the software identification, version, and cluster will be written to NVM

Display Option Code Selection
When after a display exchange, the display option code is not properly set, it will result in a TV with “no display”. Therefore, **it is required** to set this display option code after such a repair.

To do so, press the following key sequence on a standard RC transmitter: “**062598**” directly followed by **MENU** and “**xxx**”, where “xxx” is a 3 digit decimal value of the panel type (see first column in table “Display Code Overview” or sticker on the side/ bottom of the cabinet). When the value is properly accepted and stored in NVM, the set will switch to Stand-by, to indicate that the process has been completed successfully.

During this algorithm, the NVM-content must be filtered, because several items in the NVM are TV-related and not SSB-related (e.g. Model and Prod. S/N). Therefore, “Model” and “Prod. S/N” data is changed into “See Type Plate”.
In case a call centre or consumer reads “See Type Plate” in CSM mode, he needs to look to the side/bottom sticker to identify the set, for further actions.

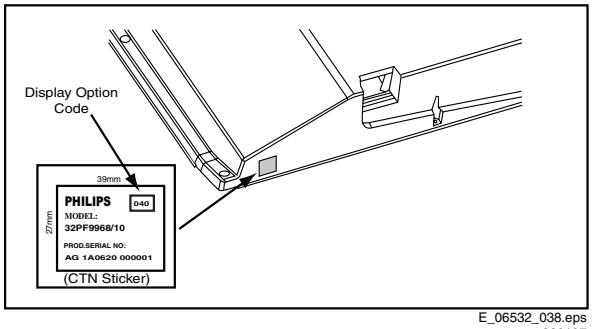

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Figure 5-1 Location of Display Option Code sticker

Table 5-1 Display option code overview

Display option	HEX	Display type	Brand	Size	Vert. resolution	Hor. resolution	Type number	12 NC
045	2D	LCD	LPL	26	768p	1366	LC260WX2-SLB2	9322 234 13682
046	2E	LCD	LPL	32	768p	1366	LC320W01-SL06	9322 230 03682
068	44	LCD	CMO	26	768p	1366	V260B1-L03	9322 249 37682
069	45	LCD	CMO	32	768p	1366	V315B1 L05	9322 248 65682
070	46	LCD	CPT	32	768p	1366	CLLAA320WB02P	9322 245 31682
071	47	LCD	LPL	37	768p	1366	LC370WX1-SLB1	9322 246 96682
072	48	LCD	AUO	37	768p	1366	T370XW02V5	9322 249 77682
073	49	LCD	LPL	42	768p	1366	LC420WX3-SLA1	9322 246 97682
076	4B	LCD	AUO	42	768p	1366	T420XW01V8	9322 249 10682
083	53	PDP	SDI	42	768p	1024	S42AX-YD04(PS-426-PH)	9322 246 76682
085	55	PDP	SDI	50	768p	1366	S50HW-YD05(PS-506-PH)	9322 246 81682
091	5B	LCD	AUO	32	768p	1366	T315XW02VD	9322 249 06682
093	5D	LCD	LPL	42	1080p	1920	LC420WU2-SLA1	9322 246 84682
103	67	LCD	LPL	20	480p	640	LC201V02-SDB1	9322 242 65682
105	69	LCD	CMO	19	900p	1440	TPM190A1-L02	9965 000 43654
106	6A	LCD	AUO	23	768p	1366	T230XW01V3	9322 249 79682
107	6B	LCD	LPL	42	768p	1366	LC420WX5-SLD1	9322 249 09682

5.2.2 Service Default Mode (SDM)

Purpose

Set the TV in SDM mode in order to be able to:

- Create a predefined setting for measurements to be made.
- Override software protections.
- Start the blinking LED procedure.
- Read the error buffer.
- Check the life timer.

Specifications

Table 5-2 SDM default settings

Region	Freq. (MHz)	Default syst.
Europe (except France), AP-PAL/-Multi	475.25	PAL B/G
France		SECAM L
NAFTA, AP-NTSC	61.25 (channel 3)	NTSC M
LATAM		PAL M

- Set linear video and audio settings to 50 %, but volume to 25 %. Stored user settings are not affected.
- All service-unfriendly modes (if present) are disabled, since they interfere with diagnosing/repairing a set.. These service unfriendly modes are:
  - (Sleep) timer.
  - Blue mute/Wall paper.
  - Auto switch “off” (when there is no “ident” signal).
  - Hotel or hospital mode.
  - Child lock or parental lock (manual or via V-chip).
  - Skipping, blanking of “Not favourite”, “Skipped” or “Locked” presets/channels.
  - Automatic storing of Personal Preset or Last Status settings.
  - Automatic user menu time-out (menu switches back/ OFF automatically.
  - Auto Volume levelling (AVL).

How to Activate

To activate SDM, use **one** of the following methods:

- Press the following key sequence on the remote control transmitter: “**062596**” directly followed by the **MENU** button (do not allow the display to time out between entries while keying the sequence).
- Short one of the “Service” jumpers on the TV board during cold start (see Figures “Service jumper”). Then press the mains button (remove the short after start-up). **Caution**: Activating SDM by shorting “Service” jumpers will override the DC speaker protection (error 1), the General I2C error (error 4), and the Trident video processor error (error 5). When doing this, the service-technician must know exactly what he is doing, as it could damage the television set.

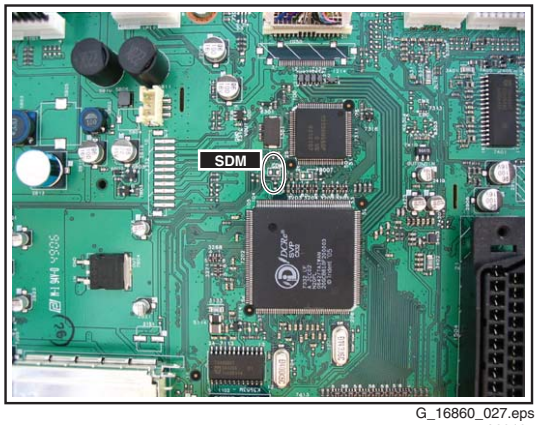

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Figure 5-2 Service jumper (SSB component side)

On Screen Menu

After activating SDM, the following screen is visible, with SDM in the upper right corner of the screen to indicate that the television is in Service Default Mode.

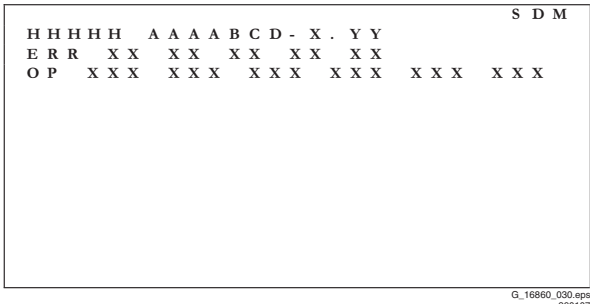

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Figure 5-3 SDM menu

Menu explanation:

- **HHHHH**: Are the operating hours (in decimal).
- **AAAABCD-X.YY**: See paragraph “Service Modes” -> “General” -> “Software Identification, Version, and Cluster” for the SW name definition.
- **SDM**: The character “SDM” to indicate that the TV set is in Service mode.
- **ERR**: Shows all errors detected since the last time the buffer was erased. Five errors possible.
- **OP**: Used to read-out the option bytes. See “Options” in the Alignments section for a detailed description. Seven codes are possible.

How to Navigate

As this mode is read only, there is not much to navigate. To switch to other modes, use one of the following methods:

- Command MENU from the user remote will enter the normal user menu (brightness, contrast, colour, etc...) with “SDM” OSD remaining, and pressing MENU key again will return to the last status of SDM again.
- To prevent the OSD from interfering with measurements in SDM, command “OSD” (“STATUS” for NAFTA and LATAM) from the user remote will toggle the OSD “on/off” with “SDM” OSD remaining always “on”.
- Press the following key sequence on the remote control transmitter: “**062596**” directly followed by the **OSD/i+** button to switch to SAM (do not allow the display to time out between entries while keying the sequence).

How to Exit

Switch the set to STANDBY by pressing the mains button on the remote control transmitter or on the television set.
If you switch the television set “off” by removing the mains (i.e., unplugging the television), the television set will remain in SDM when mains is re-applied, and the error buffer is not cleared. The error buffer will only be cleared when the “clear” command is used in the SAM menu.

Note:

- If the TV is switched “off” by a power interrupt while in SDM, the TV will show up in the last status of SDM menu as soon as the power is supplied again. The error buffer will not be cleared.
- In case the set is in Factory mode by accident (with “F” displayed on screen), by pressing and hold “VOL-“ and “CH-” together should leave Factory mode.

5.2.3 Service Alignment Mode (SAM)

Purpose
- To change option settings.
- To display / clear the error code buffer.
- To perform alignments.

Specifications
- Operation hours counter (maximum five digits displayed).
- Software version, error codes, and option settings display.
- Error buffer clearing.
- Option settings.
- Software alignments (Tuner, White Tone, and Audio).
- NVM Editor.
- ComPair Mode switching.
- Set the screen mode to full screen (all contents on screen are viewable).

How to Activate
To activate SAM, use one of the following methods:
- Press the following key sequence on the remote control transmitter: "**062596**" directly followed by the **OSD/ STATUS/INFO/i+** button (it depends on region which button is present on the RC). Do not allow the display to time out between entries while keying the sequence.
- Or via ComPair.

After entering SAM, the following screen is visible, with SAM in the upper right corner of the screen to indicate that the television is in Service Alignment Mode.

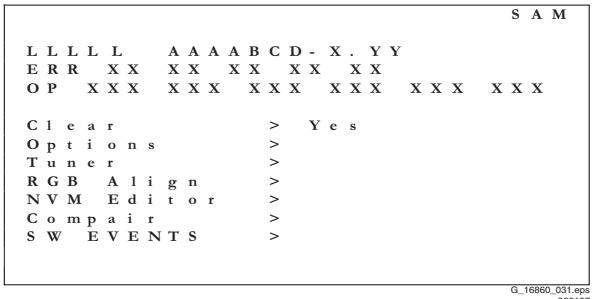

Figure 5-4 SAM menu

Menu explanation:
1. **LLLLL.** This represents the run timer. The run timer counts normal operation hours, but does not count Stand-by hours.
2. **AAAABCD-X.YY.** See paragraph "Service Modes" -> "General" -> "Software Identification, Version, and Cluster" for the SW name definition.
3. **SAM.** Indication of the Service Alignment Mode.
4. **ERR (ERRor buffer).** Shows all errors detected since the last time the buffer was erased. Five errors possible.
5. **OP (Option Bytes).** Used to read-out the option bytes. See "Options" in the Alignments section for a detailed description. Seven codes are possible.
6. **Clear.** Erases the contents of the error buffer. Select the CLEAR menu item and press the MENU RIGHT key. The content of the error buffer is cleared.
7. **Options.** Used to set the option bits. See "Options" in the "Alignments" chapter for a detailed description.
8. **Tuner.** Used to align the tuner. See "Tuner" in the "Alignments" chapter for a detailed description.
9. **RGB Align.** Used to align the White Tone. See "White Tone" in the "Alignments" chapter for a detailed description.
10. **NVM Editor.** Can be used to change the NVM data in the television set. See also paragraph "Fault Finding and Repair Tips" further on.
11. **ComPalr.** Can be used to switch the television to "In Application Programming" mode (IAP), for software uploading via ComPair. Read paragraph "Service Tools" -> "ComPair". **Caution:** When this mode is selected without ComPair connected, the TV will be blocked. Remove the AC power to reset the TV.
12. **SW Events.** Only to be used by development to monitor SW behaviour during stress test.

How to Navigate
- In the SAM menu, select menu items with the MENU UP/ DOWN keys on the remote control transmitter. The selected item will be indicated. When not all menu items fit on the screen, use the MENU UP/DOWN keys to display the next / previous menu items.
- With the MENU LEFT/RIGHT keys, it is possible to:
  - Activate the selected menu item.
  - Change the value of the selected menu item.
  - Activate the selected submenu.
- When you press the MENU button twice while in top level SAM, the set will switch to the normal user menu (with the SAM mode still active in the background). To return to the SAM menu press the MENU button.
- Command "OSD/i+" key from the user remote will toggle the OSD "on/off" with "SAM" OSD remaining always "on".
- Press the following key sequence on the remote control transmitter: "**062596**" directly followed by the **MENU** button to switch to SDM (do not allow the display to time out between entries while keying the sequence).

How to Store SAM Settings
To store the settings changed in SAM mode (except the OPTIONS settings), leave the top level SAM menu by using the POWER button on the remote control transmitter or the television set.

How to Exit
Switch the set to STANDBY by pressing the mains button on the remote control transmitter or the television set.

Note:
- When the TV is switched "off" by a power interrupt while in SAM, the TV will show up in "normal operation mode" as soon as the power is supplied again. The error buffer will not be cleared.
- In case the set is in Factory mode by accident (with "F" displayed on screen), by pressing and hold "VOL-" and "CH-" together should leave Factory mode.

5.2.4 Customer Service Mode (CSM)

Purpose
The Customer Service Mode shows error codes and information on the TV's operation settings. A call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set. This helps them to diagnose problems and failures in the TV before making a service call. The CSM is a read-only mode; therefore, modifications are not possible in this mode.

Specifications
- Ignore "Service unfriendly modes".
- Line number for every line (to make CSM language independent).
- Set the screen mode to full screen (all contents on screen are viewable).
- After leaving the Customer Service Mode, the original settings are restored.
- Possibility to use "CH+" or "CH-" for channel surfing, or enter the specific channel number on the RC.

How to Activate
To activate CSM, press the following key sequence on the remote control transmitter: "**123654**" (do not allow the display to time out between entries while keying the sequence).

Upon entering the Customer Service Mode, the following screen will appear:

```
                                                    C S M
1    M O D E L  : 3 2 P F L 5 5 2 2 D / 1 0
2    P R O D  S / N : A G 1 A 0 7 1 2 1 2 3 4 5 6
3    S W  I D  : L C 7 1 E L 1 - 1 . x x
4    O P       : X X X  X X X  X X X  X X X  X X X  X X X
5    C O D E S  : X X  X X  X X  X X  X X
6    S S B      : 3 1 3 9  1 2 7  1 2 3 4 1
7    N V M      : X X X X X X X X
8    F l a s h  D a t a : X X . X X . X X . X X
9    L I F E  T I M E R : L L L L L
10   T U N E R  : W E A K / G O O D / S T R O N G
11   S Y S T E M : P A L / N T S C / S E C A M
12   S O U N D  : M O N O / S T E R E O / N I C A M
13   H D A U    : Y E S / N O
14   F O R M A T : X X X X X X X X
```

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Figure 5-5 CSM menu

Menu Explanation

1. **MODEL.** Type number, e.g. 32PFL5522D/10. (*)
2. **PROD S/N.** Product serial no., e.g. AG1A0712123456. (*)
3. **SW ID.** Software cluster and version is displayed.
4. **OP.** Option code information.
5. **CODES.** Error buffer contents.
6. **SSB.** Indication of the SSB factory identification code (12nc). (*)
7. **NVM.** The NVM software version no.
8. **Flash Data.** PQ (picture quality) and AQ (audio quality) data version. This is a sub set of the main SW.
9. **LIFE TIMER.** Operating hours indication.
10. **TUNER.** Indicates the tuner signal condition: “Weak” when signal falls below threshold value, “Medium” when signal is at mid-range, and “Strong” when signal falls above threshold value.
11. **SYSTEM.** Gives information about the video system of the selected transmitter (PAL/SECAM/NTSC).
12. **SOUND.** Gives information about the audio system of the selected transmitter (MONO/STEREO/NICAM).
13. **HDAU.** HDMI audio stream detection. “YES” means audio stream detected. “NO” means no audio stream present. Only displayed when HDMI source is selected.
14. **FORMAT.** Gives information about the video format of the selected transmitter (480i/480p/720p/1080i).
15. **HD SW ID.** Software version of the 1080p full HD module (when present).
16. **Reserved.**
17. **Reserved.**
18. **Reserved.**

(*) If an NVM IC is replaced or initialised, this data must be re-written to the NVM. ComPair will foresee in a possibility to do this.

How to Exit

To exit CSM, use one of the following methods:

- Press the MENU button twice, or POWER button on the remote control transmitter.
- Press the POWER button on the television set.

5.3 Service Tools

5.3.1 ComPair

Introduction

ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products. and offers the following:

1. ComPair helps you to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. You do not have to know anything about I2C or UART commands yourself, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the uP is working) and all repair information is directly available.
4. ComPair features TV software up possibilities.

Specifications

ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The (new) ComPair II interface box is connected **to the PC** via an USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).
The ComPair fault finding program is able to determine the problem of the defective television, by a combination of automatic diagnostics and an interactive question/answer procedure.

How to Connect

This is described in the chassis fault finding database in ComPair.

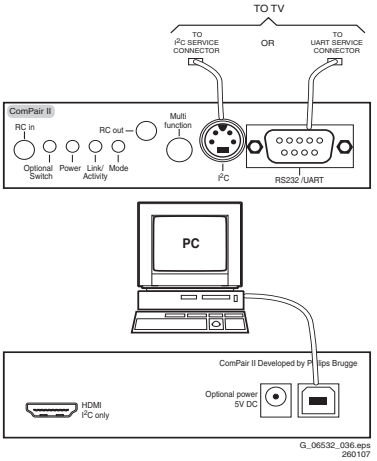


Figure 5-6 ComPair II interface connection

Caution: It is compulsory to connect the TV to the PC as shown in the picture above (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be blown!

How to Order

ComPair II order codes:

- ComPair II interface: 3122 785 91020.
- ComPair32 CD (update): 3122 785 60160.
- ComPair interface cable: 3122 785 90004.
- ComPair interface extension cable: 3139 131 03791.
- ComPair UART interface cable: 3122 785 90630.

Note: If you encounter any problems, contact your local support desk

5.3.2 LVDS Tool

Introduction

This Service tool (also called “ComPair Assistant 1“) may help you to identify, in case the TV does not show any picture, whether the Small Signal Board (SSB) **or** the display of a Flat TV is defective. Thus to determine if LVDS, RGB, and sync signals are okay.
Furthermore it is possible to program EPLDs with this tool (Byte blaster). Read the user manual for an explanation of this feature.

When operating, the tool will show a small (scaled) picture on a VGA monitor. Due to a limited memory capacity, it is not possible to increase the size when processing high-resolution

LVDS signals (> 1280x960). Below this resolution, or when a DVI monitor is used, the displayed picture will be full size.

How to Connect
Connections are explained in the user manual, which is packed with the tool. The LVDS cables included in the package cover most chassis. For some chassis, a separate cable must be ordered.

Note: To use the LVDS tool, you must have ComPair release 2004-1 (or later) on your PC (engine version >= 2.2.05).
For every TV type number and screen size, one must choose the proper settings via ComPair. The ComPair file will be updated regularly with new introduced chassis information.

How to Order
- LVDS tool (incl. two LVDS cables: 31p and 20p, covering chassis BJx.x, EJx.x, FJx.x and LC4.1): 3122 785 90671.
- LVDS tool Service Manual: 3122 785 00810.
- LVDS cable 20p/DF -> 20p/DF (standard with tool): 3122 785 90731.
- LVDS cable 31p/FI -> 31p/FI (standard with tool): 3122 785 90662.

For other chassis, a separare LVDS cable must be ordered. Refer to table “LVDS cable order number” for an overview of all deliverable cables.

Table 5-3 LVDS cable order number

Chassis	LVDS cable order number	Remarks
BJ2.4	3122 785 90662[1]	
BJ2.5	3122 785 90662[1]	
BJ3.0	3122 785 90662[1]	
BJ3.1	3122 785 90662[1]	
EJ2.0	3122 785 90662[1]	
EJ3.0	3122 785 90662[1]	
EL1.1	3122 785 90662[1] / 3122 785 90821	
FJ3.0	3122 785 90662[1]	
FTL2.4	3122 785 90662[1,2]	
LC4.1	3122 785 90731[1] / 3122 785 90851	
LC4.3	3122 785 90821	
LC4.31	3122 785 90821	
LC4.41	3122 785 90662[1,2] / 3122 785 90851	only for 26 & 32” sets
LC4.8	3122 785 90662[1,2] / 3122 785 90851	
LC4.9	3122 785 90662[1,2] / 3122 785 90851	MFD variant only
LC7.2	tbd	
JL2.1	3122 785 90861	

Notes
1. Included in LVDS tool package (order code 3122 785 90671)
2. Pins 27 and 28 should be grounded or not connected.

5.4 Error Codes

5.4.1 Introduction

Error codes are required to indicate failures in the TV set. In principle a unique error code is available for every:
- Activated protection.
- Failing I2C device.
- General I2C error.
- SDRAM failure.

The last five errors, stored in the NVM, are shown in the Service menu’s. This is called the error buffer.
The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.
An error will be added to the buffer if this error differs from any error in the buffer. The last found error is displayed on the left.
An error with a designated error code may **never** lead to a deadlock situation. This means that it must always be diagnosable (e.g. error buffer via OSD or blinking LED procedure, ComPair to read from the NVM).
In case a failure identified by an error code automatically results in other error codes (cause and effect), only the error code of the MAIN failure is displayed.

Example: In case of a failure of the I2C bus (CAUSE), the error code for a “General I2C failure” and “Protection errors” is displayed. The error codes for the single devices (EFFECT) is not displayed. All error codes are stored in the same error buffer (TV’s NVM) except when the NVM itself is defective.

5.4.2 How to Read the Error Buffer

You can read the error buffer in 3 ways:
- On screen via the SAM/SDM/CSM (if you have a picture). Example:
  - ERROR: 0 0 0 0 0 : No errors detected
  - ERROR: 6 0 0 0 0 : Error code 6 is the last and only detected error
  - ERROR: 9 6 0 0 0 : Error code 6 was detected first and error code 9 is the last detected (newest) error
- Via the blinking LED procedure (when you have no picture). See “The Blinking LED Procedure”.
- Via ComPair.

5.4.3 Error Codes

In case of non-intermittent faults, write down the errors present in the error buffer and clear the error buffer before you begin the repair. This ensures that old error codes are no longer present.
If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error and not the actual cause of the problem (for example, a fault in the protection detection circuitry can also lead to a protection).

Table 5-4 Error code overview

Error code[1)]	Description	Item nr.	Remarks
0	No error.		
1	DC Protection of speakers.		
2	+12V protection error.		12V missing or "low".
3	Reserved.		
4	General I2C error.		note 2
5	Trident Video Processor communication error.	7202	When Trident IC is defective, error 10 and 14 might also be reported. Trident communicates via parallel bus, not via the I2C bus. The I2C bus of Trident is only used in ComPair mode.
6	I2C error while communicating with the NVM.	7315	The TV will not start-up due to critical dta not available from the NVM, but the LED will blink the error code.
7	I2C error while communicating with the Tuner.	1101	
8	I2C error while communicating with the IF Demodulator.	7113	
9	I2C error communicating with the Sound Processor.	7411	
10	SDRAM defective.	7204	
11	I2C error while communicating with the HDMI IC.	7817	
12	I2C error while communicating with the MOJO PNX8314.	7G00	if applicable
13	DVB HW communication error.	7F01, 7K00, 7G00	if applicable
14	SDRAM defective.	7205	
15	Reserved.		
16	Reserved.		
17	Reserved.		
18	I2C error while communicating with the iBoard processor.		if applicable
19	I2C error while communication with 1080p bolt-on module.		if applicable

Notes

1. Some of the error codes reported are depending on the option code configurations.
2. This error means: no I2C device is responding to the particular I2C bus. Possible causes: SCL/SDA shorted to GND, SCL shorted to SDA, or SCL/SDA open (at uP pin). The internal bus of the Trident platform should not cause the entire system to halt as such an error can be reported.

5.4.4 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:

- By using the CLEAR command in the SAM menu:
  - To enter SAM, press the following key sequence on the remote control transmitter: "**062596**" directly followed by the OSD/i+ button (do not allow the display to time out between entries while keying the sequence).
  - Make sure the menu item CLEAR is selected. Use the MENU UP/DOWN buttons, if necessary.
  - Press the MENU RIGHT button to clear the error buffer. The text on the right side of the "CLEAR" line will change from "CLEAR?" to "CLEARED"
- If the contents of the error buffer have not changed for 50 hours, the error buffer resets automatically.

Note: If you exit SAM by disconnecting the mains from the television set, the error buffer is not reset.

5.5 The Blinking LED Procedure

5.5.1 Introduction

The software is capable of identifying different kinds of errors. Because it is possible that more than one error can occur over time, an error buffer is available, which is capable of storing the last five errors that occurred. This is useful if the OSD is not working properly.

Errors can also be displayed by the blinking LED procedure. The method is to repeatedly let the front LED pulse with as many pulses as the error code number, followed by a period of 1.5 seconds in which the LED is “off”. Then this sequence is repeated.

Example (1): error code 4 will result in four times the sequence LED “on” for 0.25 seconds / LED “off” for 0.25 seconds. After this sequence, the LED will be “off” for 1.5 seconds. Any RC5 command terminates the sequence. Error code LED blinking is in red colour.

Example (2): the content of the error buffer is “**12 9 6 0 0**” After entering SDM, the following occurs:
- 1 long blink of 5 seconds to start the sequence,
- 12 short blinks followed by a pause of 1.5 seconds,
- 9 short blinks followed by a pause of 1.5 seconds,
- 6 short blinks followed by a pause of 1.5 seconds,
- 1 long blink of 1.5 seconds to finish the sequence,
- The sequence starts again with 12 short blinks.

5.5.2 Displaying the Entire Error Buffer

Additionally, the entire error buffer is displayed when Service Mode “SDM” is entered. In case the TV set is in protection or Stand-by: The blinking LED procedure sequence (as in SDM-mode in normal operation) must be triggered by the following RC sequence: “**MUTE” “062500” “OK**”.
In order to avoid confusion with RC5 signal reception blinking, this blinking procedure is terminated when a RC5 command is received.

To erase the error buffer, the RC command “**MUTE” “062599 “OK**” can be used.

5.6 TV Main Software Upgrade

For instructions on how to upgrade the TV Main software, refer to ComPair.

5.7 Fault Finding and Repair Tips

Notes:
- It is assumed that the components are mounted correctly with correct values and no bad solder joints.
- Before any fault finding actions, check if the correct options are set.

5.7.1 NVM Editor

In some cases, it can be convenient if one directly can change the NVM contents. This can be done with the “NVM Editor” in SAM mode. With this option, single bytes can be changed.

Caution:
- **Do not change the NVM settings without understanding the function of each setting, because incorrect NVM settings may seriously hamper the correct functioning of the TV set!**
- Always write down the existing NVM settings, before changing the settings. This will enable you to return to the original settings, if the new settings turn out to be incorrect.

Table 5-5 NVM editor overview

	Hex	Dec	Description
.ADR	0x000A	10	Existing value
.VAL	0x0000	0	New value
.Store	Store?		

5.7.2 Load Default NVM Values

It is possible to download default values automatically into the NVM in case a blank NVM is placed or when the NVM first 20 address contents are "FF". After the default values are downloaded, it is possible to start-up and to start aligning the TV set. To initiate a forced default download the following action has to be performed:
1. Switch “off” the TV set with the mains cord disconnected from the wall outlet (it does not matter if this is from "Standby" or "Off" situation).
2. Short-circuit the SDM jumpers on the SSB (keep short circuited).
3. Press “P+” or “CH+” on the local keyboard (and keep it pressed).
4. Reconnect the mains supply to the wall outlet.
5. Release the “P+” or “CH+” when the set is “on” or blue LED is blinking.

When the downloading has completed successfully, the set should be into Standby, i.e. red LED on.

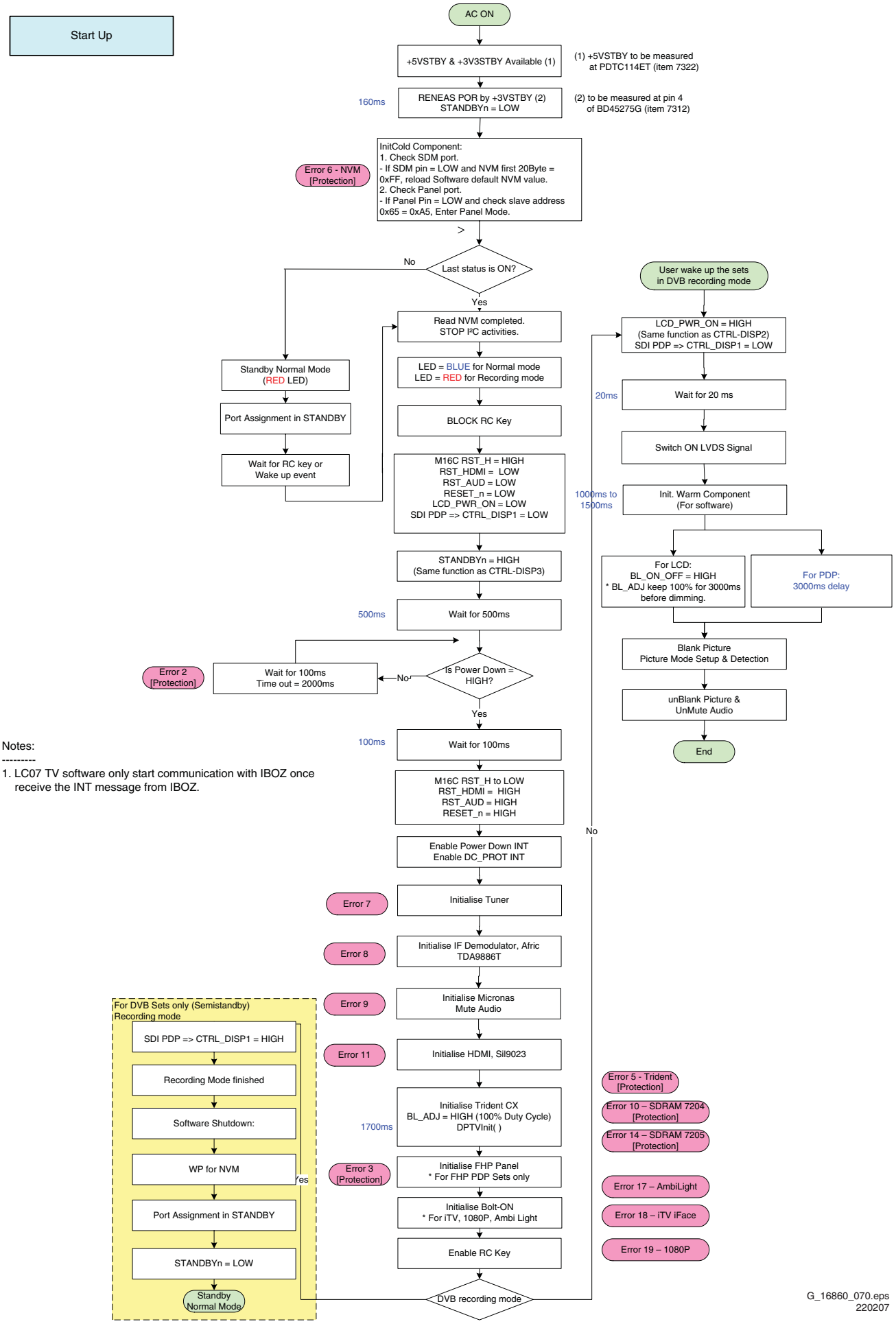
Alternative method (1):
1. Go to SAM.
2. Select NVM Editor.
3. Select ADR (address) to 1 (dec).
4. Change the VAL (value) to 170 (dec).
5. Store the value.
6. Do a hard reset to make sure new default values took place.

Alternative method (2):
It is also possible to upload the default values to the NVM with ComPair in case the SW is changed, the NVM is replaced with a new (empty) one, or when the NVM content is corrupted. After replacing an EEPROM (or with a defective/no EEPROM), default settings should be used to enable the set to start-up and allow the Service Default Mode and Service Alignment Mode to be accessed.

5.7.3 Start-up/Shut-down Flowcharts

Important note for DVB sets:
- When you put a DVB set into Stand-by mode **with an RC**, the set will go to “Semi Stand-by” mode for 5 minutes. This, to facilitate “Off the Air download” (OAD). If there is no activity within these 5 minutes, the set will switch to Stand-by mode. In “Semi Stand-by” mode, the LCD backlight and Audio Amplifier are turned “off” but other circuits still work as normal. The customer might think the set is in Stand-by. However, in real Stand-by mode, only the uP and the NVM are alive and all other circuits are switched “off”.
- If you press **the mains switch** at the local key board in a DVB set, the set will switch to Stand-by mode.

On the next pages you will find start-up and shut-down flowcharts, which might be helpful during fault finding.
It should be noted, that some events are only related to PDP sets, and therefore not applicable to this LCD chassis.


Start Up
AC ON
+5VSTBY & +3V3STBY Available (1)
(1) +5VSTBY to be measured at PDTC114ET (item 7322)
160ms
RENEAS POR by +3VSTBY (2) STANDBYn = LOW
(2) to be measured at pin 4 of BD45275G (item 7312)
Error 6 - NVM [Protection]
InitCold Component:
1. Check SDM port.
- If SDM pin = LOW and NVM first 20Byte = 0xFF, reload Software default NVM value.
2. Check Panel port.
- If Panel Pin = LOW and check slave address 0x65 = 0xA5, Enter Panel Mode.
Last status is ON?
No
Yes
Standby Normal Mode (RED LED)
Port Assignment in STANDBY
Wait for RC key or Wake up event
Read NVM completed. STOP I²C activities.
LED = BLUE for Normal mode LED = RED for Recording mode
BLOCK RC Key
M16C RST_H = HIGH RST_HDMI = LOW RST_AUD = LOW RESET_n = LOW LCD_PWR_ON = LOW SDI PDP => CTRL_DISP1 = LOW
STANDBYn = HIGH (Same function as CTRL-DISP3)
500ms
Wait for 500ms
Error 2 [Protection]
Wait for 100ms Time out = 2000ms
No
Is Power Down = HIGH?
Yes
100ms
Wait for 100ms
M16C RST_H to LOW RST_HDMI = HIGH RST_AUD = HIGH RESET_n = HIGH
Enable Power Down INT Enable DC_PROT INT
Error 7
Initialise Tuner
Error 8
Initialise IF Demodulator, Afric TDA9886T
Error 9
Initialise Micronas Mute Audio
Error 11
Initialise HDMI, Sil9023
1700ms
Initialise Trident CX BL_ADJ = HIGH (100% Duty Cycle) DPTVInit( )
Error 3 [Protection]
Initialise FHP Panel * For FHP PDP Sets only
Initialise Bolt-ON * For iTV, 1080P, Ambi Light
Enable RC Key
DVB recording mode
No
Yes
For DVB Sets only (Semistandby) Recording mode
SDI PDP => CTRL_DISP1 = HIGH
Recording Mode finished
Software Shutdown:
WP for NVM
Port Assignment in STANDBY
STANDBYn = LOW
Standby Normal Mode
User wake up the sets in DVB recording mode
LCD_PWR_ON = HIGH (Same function as CTRL-DISP2) SDI PDP => CTRL_DISP1 = LOW
20ms
Wait for 20 ms
Switch ON LVDS Signal
1000ms to 1500ms
Init. Warm Component (For software)
For LCD: BL_ON_OFF = HIGH * BL_ADJ keep 100% for 3000ms before dimming.
For PDP: 3000ms delay
Blank Picture Picture Mode Setup & Detection
unBlank Picture & UnMute Audio
End
Error 5 - Trident [Protection]
Error 10 – SDRAM 7204 [Protection]
Error 14 – SDRAM 7205 [Protection]
Error 17 – AmbiLight
Error 18 – iTV iFace
Error 19 – 1080P

Notes:
---
1. LC07 TV software only start communication with IBOZ once receive the INT message from IBOZ.

G_16860_070.eps
220207

Figure 5-7 Start-up flowchart

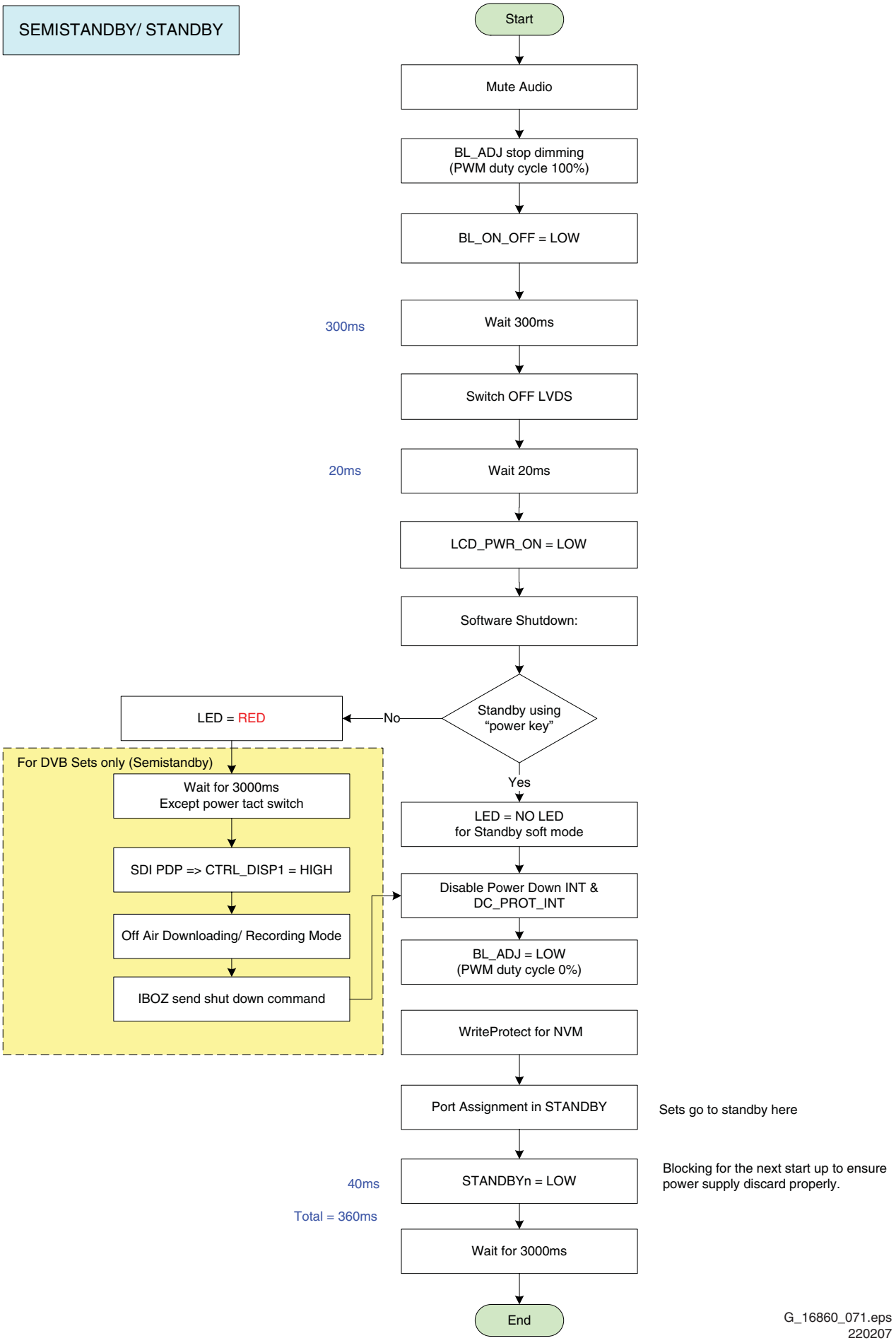
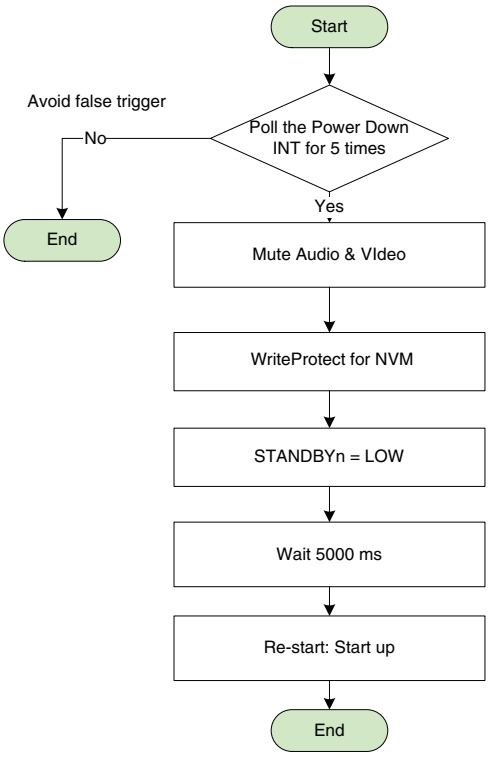


Figure 5-8 Semi Stand-by/Stand-by flowchart

Power Down INT:
AC OFF or Transient INT



Notes:
1. Power Down INT will be based on fall edge triggering
2. +3V3STBY will stay for 15ms, software must perform WriteProtect for NVM within 15ms.

DC_PROT INT

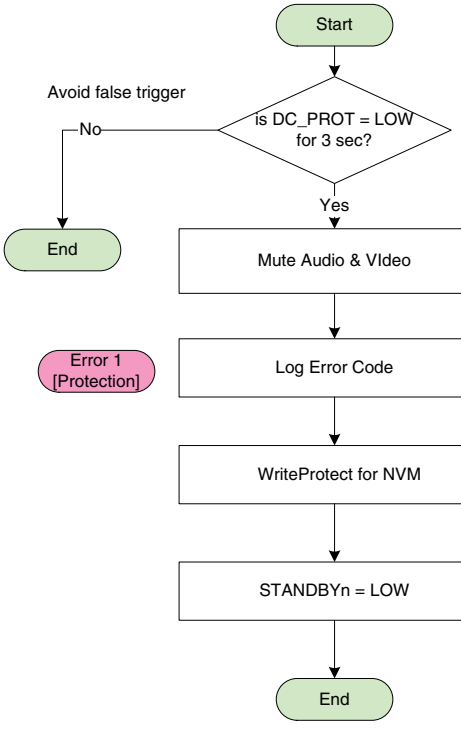


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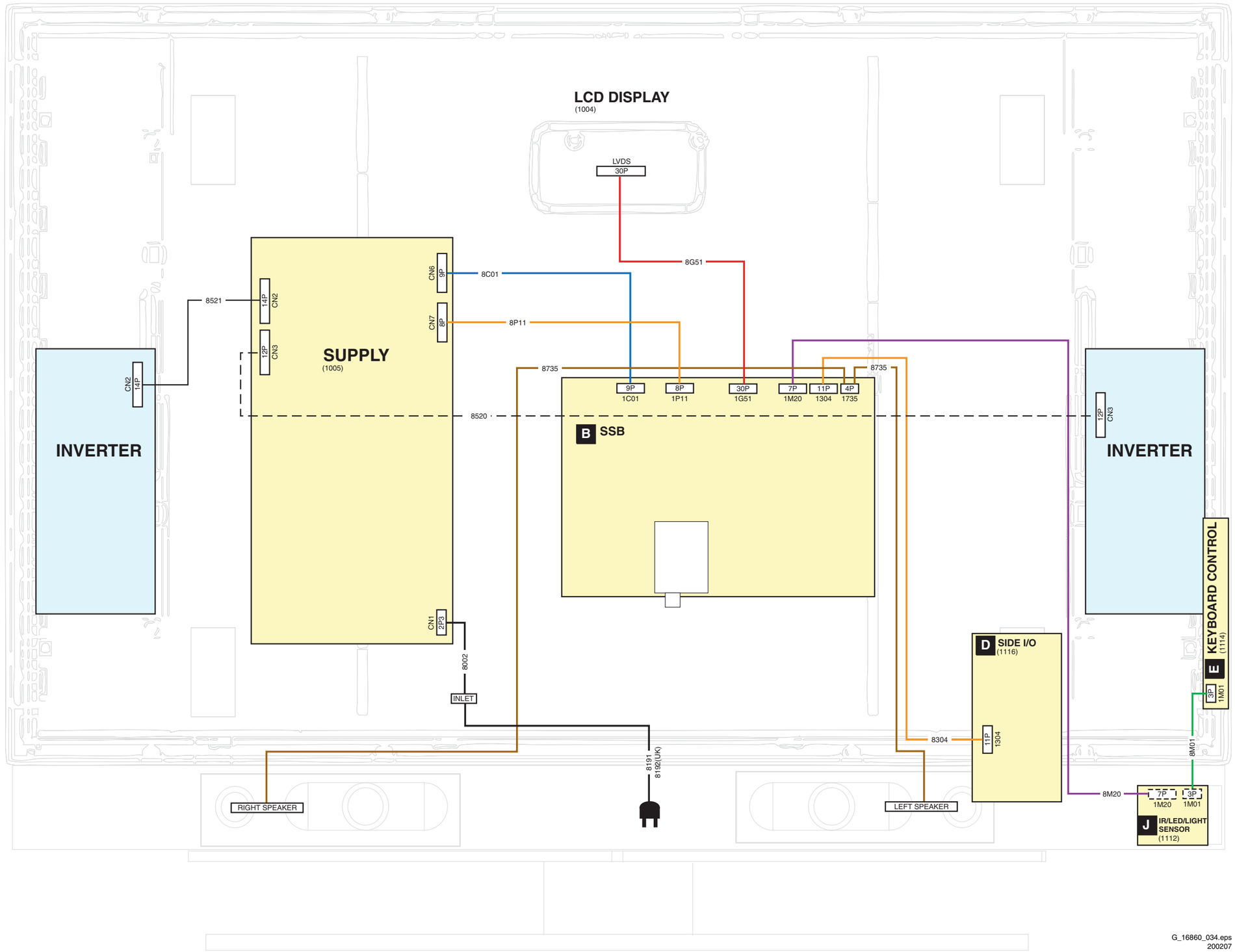
Figure 5-9 Power Down & DC_PROT flowchart

6. Block Diagrams, Test Point Overview, and Waveforms

Wiring Diagram 32”

WIRING 32” LCD (STYLING ME7)



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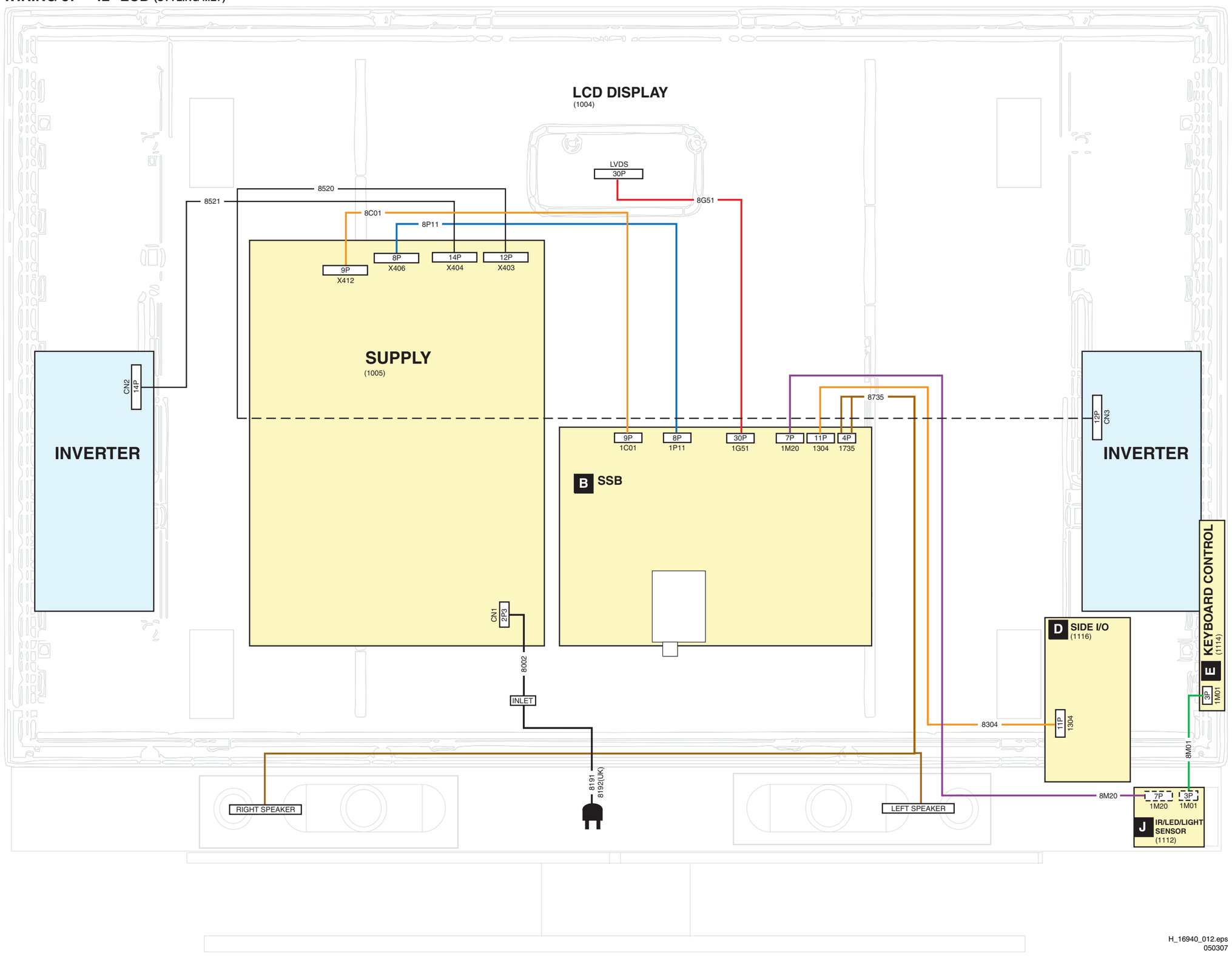
200207

Wiring Diagram 37”-42”

WIRING 37”- 42” LCD (STYLING ME7)



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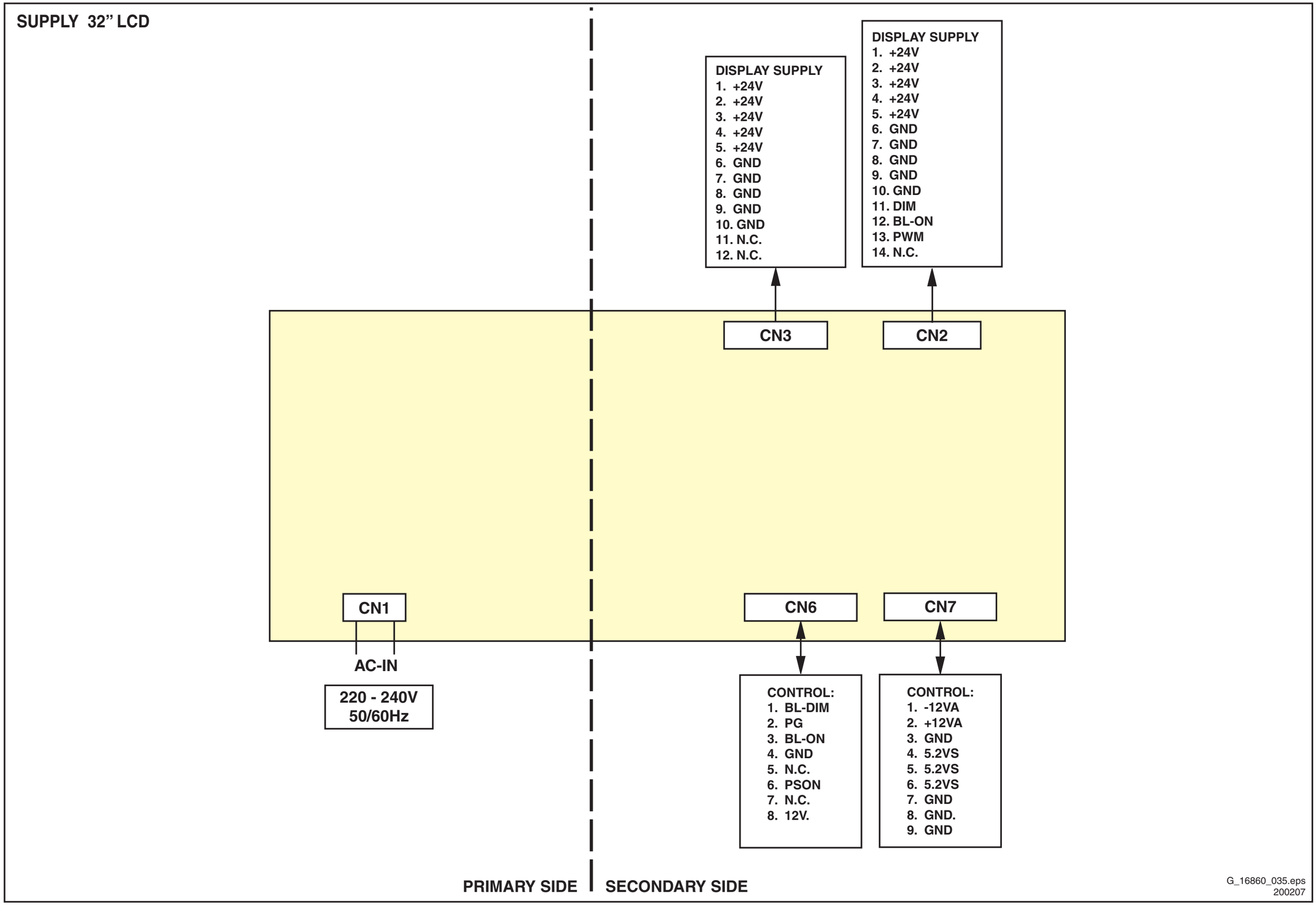
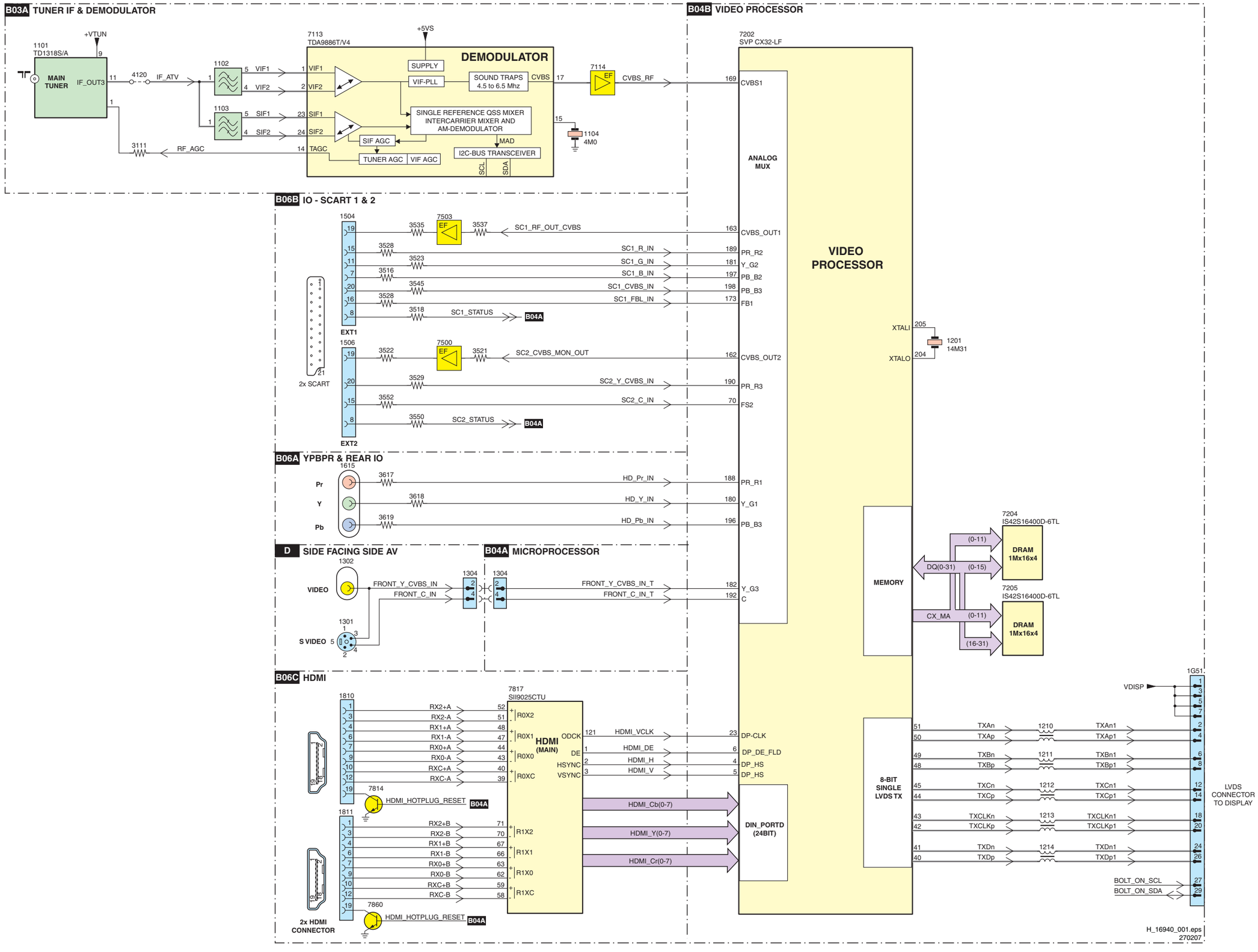
050307

Block Diagram Supply



Block Diagram Video

VIDEO



Block Diagram Audio

AUDIO

B03A TUNER IF & DEMODULATOR

1101 TD1318S/A
MAIN TUNER
+VTUN
IF_OUT3
IF-ATV
6103
3111
7109
B04A SAW_SW
RF_AGC
1102
1103
VIF1
VIF2
SIF1
SIF2
7113 TDA9886T/V4
+5VS
DEMODULATOR
SUPPLY
VIF-PLL
SOUND TRAPS 4.5 to 6.5 Mhz
CVBS
SINGLE REFERENCE QSS MIXER INTERCARRIER MIXER AND AM-DEMODULATOR
SIOMAD
SIF
SIF AGC
MAD
I2C-BUS TRANSCEIVER
TUNER AGC
VIF AGC
TAGC
SCL
SDA
1104 4M0

B04C AUDIO PROCESSOR

7411 MSP4450P-VK-E8 000 Y
SOUND PROCESSOR
ANA-IN1+
DA1
CL
WS
XTALIN
XTALOUT
1411 18M432
SUPPLY
DACM-L
DACM-R
DACA-L
DACA-R
SC1-OUT-R
SC1-IN-R
SC1-OUT-L
SC1-IN-L
SC2-OUT-R
SC2-IN-R
SC2-OUT-L
SC2-IN-L
SC4-IN-L
SC4-IN-R
SC3-IN-L
SC3-IN-R
SC5-IN-L
SC5-IN-R

B07 AUDIO

7A01 TDA8932T/N1
CLASS D POWER AMPLIFIER
AUDIO-LS_L
AUDIO-LS_R
STANDBYn
ENGAGE
DC_PROT
7A05÷7A07 DC-DETECTION
1735
LEFT SPEAKER
RIGHT SPEAKER
+5V_D
+8V
+5V_AUD

B06B I0 - SCART 1 & 2

2x SCART
1504
1506
EXT1
EXT2
SC1_AUDIO _MUTE_R
SC1_AUDIO _OUT_R
SC1_AUDIO_IN_R
SC1_AUDIO _OUT_L
SC1_AUDIO_IN_L
SC1_AUDIO _MUTE_L
SC2_AUDIO _MUTE_R
SC2_AUDIO _OUT_R
SC2_AUDIO_IN_R
SC1_AUDIO _OUT_L
SC2_AUDIO_IN_L
SC2_AUDIO _MUTE_L

B06D HEADPHONE AMP & MUTING

7901
HP_AUDIO_OUT_L
HP_AUDIO_OUT_R
ANTI_PLOP
MUTING
CONTROL
POWER_DOWN
STANDBY
MUTEn
SC1_AUDIO _MUTE_R
SC1_AUDIO _MUTE_L
SC2_AUDIO _MUTE_R
SC2_AUDIO _MUTE_L
B06B

B04A MICRO PROCESSOR

D SIDE FACING SIDE AV

HP_LOUT
HP_ROUT
1304
1303
HEAD_PH_L
HEAD_PH_R
HEADPHONE

D SIDE FACING SIDE AV

1302
AUDIO L/R IN
L_FRONT_IN
R_FRONT_IN

B04A MICROPROCESSOR

SIDE_AUDIO_IN_L_CON
SIDE_AUDIO_IN_R_CON

B06A YPBPR &REAR IO

1615
AUDIO L/R IN
COMP_AUDIO_IN_L
COMP_AUDIO_IN_R

B06C HDMI

7817 SII9025CTU
HDMI
RX2
RX1
RX0
RXC
SCK
WS
SD0
MUTE
RXxxA
RXxxB
2x HDMI CONNECTOR
HDMI_I2S_SCK
HDNI_I2S_WS
HDMI_I2S_SD
7810 UDA1334ATS/N2
AUDIO DAC
BCK
WS
DATAI
VOUTL
VOUTR
HDMI_AUDIO_IN_L
HDMI_AUDIO_IN_R

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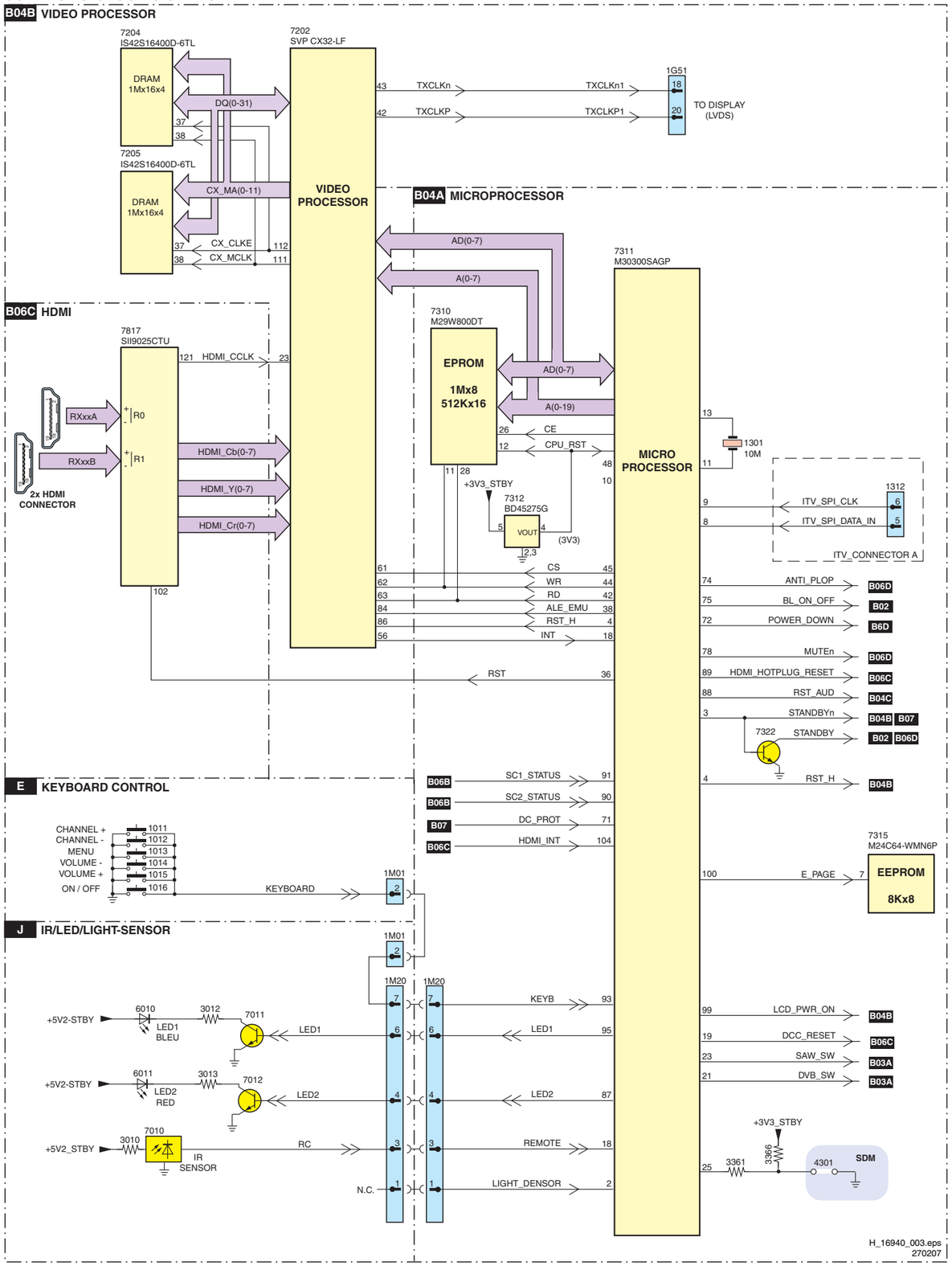
Block Diagram Control & Clock Signals

CONTROL & CLOCK SIGNALS



Test Point Overview SSB (Bottom Side)

A110 E5 F126 E7 F218 A4 F304 A3 F324 B4 F341 B3 F361 B4 F386 A5 F522 D2 F540 D3 F613 E1 F870 F3 FA04 A2 FB19 D7 FC26 A6 FF24 C10 FG20 C10 FG40 C9 FJ25 F9 FK20 D9 FK37 E9 FK54 D8 FK74 D9 I114 E5 I137 E6 I218 D5 I246 C4 I263 C4 I321 B3 I342 B4 I831 F4 IF22 F8
A115 E5 F127 E7 F219 A5 F305 B4 F325 A3 F342 F7 F362 A4 F387 A3 F523 D2 F541 D3 F614 F2 F871 F4 FA05 A3 FB20 C8 FC27 A6 FF25 F8 FG21 C10 FG41 C9 FJ26 C8 FK21 E9 FK38 D9 FK55 E8 FK75 E9 I118 E5 I138 D5 I220 A5 I247 C4 I264 D5 I322 B3 I344 B4 I833 F3 IF23 F9
A116 E5 F128 D5 F220 A5 F309 B4 F326 B3 F343 F7 F363 B5 F401 B3 F524 D2 F542 D2 F615 F5 F872 F4 FA06 A3 FB21 A8 FC28 A6 FF26 E7 FG24 C9 FG42 C10 FJ27 C9 FK22 E9 FK39 E9 FK56 E8 FK80 D10 I120 E5 I139 D5 I224 A5 I248 D4 I265 D3 I323 A3 I345 C8 I840 E3 IF24 F8
A124 E5 F129 D5 F221 A5 F310 A4 F327 A3 F344 F6 F364 B5 F402 C3 F525 C3 F543 E1 F616 F3 F873 F3 FA07 A1 FB22 A8 FC29 A6 FF27 F8 FG25 C9 FH00 B9 FK01 F9 FK23 E9 FK40 E9 FK57 E8 FK81 F10 I121 E7 I141 D6 I225 A5 I249 C4 I266 D3 I326 A5 I347 B4 I841 E3 IF25 F8
A125 E5 F130 D5 F222 A4 F311 B4 F328 B3 F345 C7 F365 B5 F403 C4 F526 C3 F544 D1 F801 E3 F874 F4 FA08 A1 FB23 A8 FF10 C8 FF28 E7 FG26 C10 FH01 D9 FK02 F10 FK24 D9 FK41 E8 FK58 D8 FK82 F9 I122 F6 I142 D5 I230 C4 I250 D5 I267 D3 I328 A3 I349 B4 I842 E3 IF26 F8
F111 E5 F131 E6 F223 A4 F312 A3 F329 B3 F346 B5 F366 B3 F510 E2 F527 C2 F601 F5 F802 E3 F875 E3 FA09 B3 FB24 A8 FF11 E8 FF29 E7 FG27 C9 FH02 B10 FK05 D8 FK25 E9 FK42 D9 FK59 E8 FK83 D9 I123 E6 I143 D5 I231 B5 I251 C4 I268 D4 I329 A3 I351 B5 I843 E3 IF27 F9
F112 E7 F132 E7 F224 A4 F313 B4 F330 A5 F347 B5 F367 A4 F511 E3 F528 C2 F602 F5 F805 D3 F876 D3 FA10 A1 FB25 A8 FF12 F8 FF30 E7 FG28 C9 FH03 B10 FK06 E9 FK26 E9 FK43 E9 FK60 E8 FK84 F9 I124 D5 I144 D5 I232 C4 I252 D4 I269 D4 I330 A4 I352 A4 I844 E4 IF28 F8
F114 E7 F133 E6 F225 A4 F314 A3 F331 B3 F348 B5 F368 A3 F512 E1 F529 C1 F603 E5 F806 E3 F877 E4 FA11 A1 FB26 A8 FF13 F7 FG10 B10 FG29 C8 FH04 B10 FK10 E9 FK27 E9 FK44 E8 FK61 E8 FL20 A2 I125 D5 I145 E6 I233 C4 I253 D4 I270 D4 I331 A4 I353 A4 I845 E4 IF29 F8
F115 F6 F134 F7 F226 A4 F315 B3 F332 B3 F349 B5 F369 B4 F513 E2 F530 C2 F604 F5 F832 F4 F901 B2 FA12 A3 FB27 B6 FF14 F8 FG11 B10 FG30 B9 FH05 D10 FK11 E9 FK28 D9 FK45 E8 FK62 E10 FL21 A2 I126 D5 I146 D6 I236 A3 I254 C4 I271 D4 I332 A3 I354 B5 I846 E3 IF30 F8
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F118 E6 F211 C4 F229 A4 F318 A3 F335 B3 F352 A4 F380 A4 F516 D2 F534 E3 F607 F2 F842 F4 F904 C2 FB11 C4 FB30 A8 FF18 E7 FG14 C10 FG33 B10 FH08 D10 FK14 E9 FK31 E9 FK48 E8 FK68 E10 FL24 A2 I129 D5 I211 A5 I240 C4 I257 D4 I313 A4 I335 B4 I362 A4 I850 F3 IG13 C9
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F121 E6 F214 A4 F232 B4 F321 B3 F338 B4 F356 A5 F383 A3 F519 E2 F537 E2 F610 F6 F851 E4 F910 B2 FB15 A8 FB33 A6 FF21 F7 FG17 C10 FG36 C10 FJ22 C9 FK17 E9 FK34 D9 FK51 E8 FK71 E10 I110 E5 I133 D5 I215 A5 I243 D4 I260 D4 I317 A4 I338 A4 I365 B4 I853 E4 IG16 C10
F122 E6 F215 A4 F302 B3 F322 A3 F339 B4 F357 A3 F384 A3 F520 D2 F538 D3 F611 F5 F861 F3 FA01 A3 FB16 C8 FB34 A6 FF22 E8 FG18 B10 FG37 B9 FJ23 C9 FK18 E9 FK35 E9 FK52 E8 FK72 E10 I111 E7 I135 D5 I216 A5 I244 C4 I261 C4 I318 A5 I339 D3 I366 B4 I854 E4 IG17 C10
F123 D6 F217 A4 F303 C4 F323 A3 F340 B3 F360 A3 F385 A4 F521 D2 F539 D2 F612 F1 F869 F3 FA02 A2 FB17 D6 FC25 A7 FF23 E7 FG19 C10 FG39 C9 FJ24 F9 FK19 E9 FK36 E9 FK53 E8 FK73 E9 I112 E5 I136 D4 I217 D5 I245 D5 I262 C4 I320 A4 I341 B5 I367 B4 I855 F3 IG18 B10
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I370 B4 I858 E4 IG21 B10
I373 A3 I861 F3 IH04 C10
I374 A3 I862 E3 IH06 D10
I376 A3 I863 F2 IH07 D9
I380 A4 I864 E3 IJ01 D8
I382 B4 I865 E3 IJ02 D8
I383 B4 I866 E3 IJ11 B9
I384 B4 I901 B2 IJ63 C9
I387 B5 I902 B2 IJ64 C9
I388 F7 I903 B2 IJ65 C9
I389 A5 I904 B2 IJ66 C9
I390 A5 I905 B2 IJ67 F9
I391 B5 I911 B1 IJ68 F9
I392 B5 I912 E1 IK68 E9
I393 A4 I913 C1 IK69 F9
I394 A4 I914 B1 IK70 F9
I395 A4 I915 C1 IK72 E9
I396 B5 I916 B1 IK73 E9
I397 A5 I917 B1 IK75 C9
I398 B4 I918 C1 IK76 F9
I399 D3 I919 E2 IK84 F8
I412 C3 I920 E1 IK85 F9
I413 C3 I921 E2 IL20 A2
I414 B3 I922 E1 IL21 A3
I415 B3 I923 C1 IL22 A2
I416 B3 I924 B2 IL23 A2
I417 B3 IA01 A2
I418 B3 IA02 A2
I419 B3 IA03 A2
I420 C3 IA04 A2
I421 C3 IA05 A3
I422 C3 IA06 A3
I423 C3 IA07 A2
I424 C3 IA09 B2
I425 C3 IA10 B3
I426 B3 IA11 B3
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I428 D4 IA13 B2
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I432 D3 IA17 A1
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I517 E1 IA20 B2
I520 D1 IA21 A2
I528 C2 IA22 B2
I530 C2 IA23 A2
I533 C1 IA24 A2
I540 E2 IA25 A2
I541 E2 IA26 A2
I543 C2 IA27 A2
I544 C1 IA29 A2
I545 D2 IA30 A2
I548 C3 IA31 A2
I549 C3 IA33 A3
I550 C3 IA34 A2
I551 C2 IA35 A2
I552 C2 IA36 A2
I553 D3 IA37 A1
I554 C3 IA38 B2
I556 C2 IA39 B2
I557 C2 IA40 A2
I610 E2 IA41 A3
I611 E2 IB10 A8
I615 E5 IB11 B8
I623 E2 IB12 A8
I627 E2 IB13 A8
I631 E5 IB14 B6
I632 F5 IB15 B6
I633 F5 IB17 A8
I635 F5 IB18 A6
I636 E5 IB19 A8
I801 E3 IB20 B8
I802 E2 IF10 F7
I803 E2 IF11 C9
I804 E2 IF12 F7
I805 E3 IF13 F8
I806 E2 IF14 E7
I813 E3 IF15 E7
I814 E4 IF16 E8
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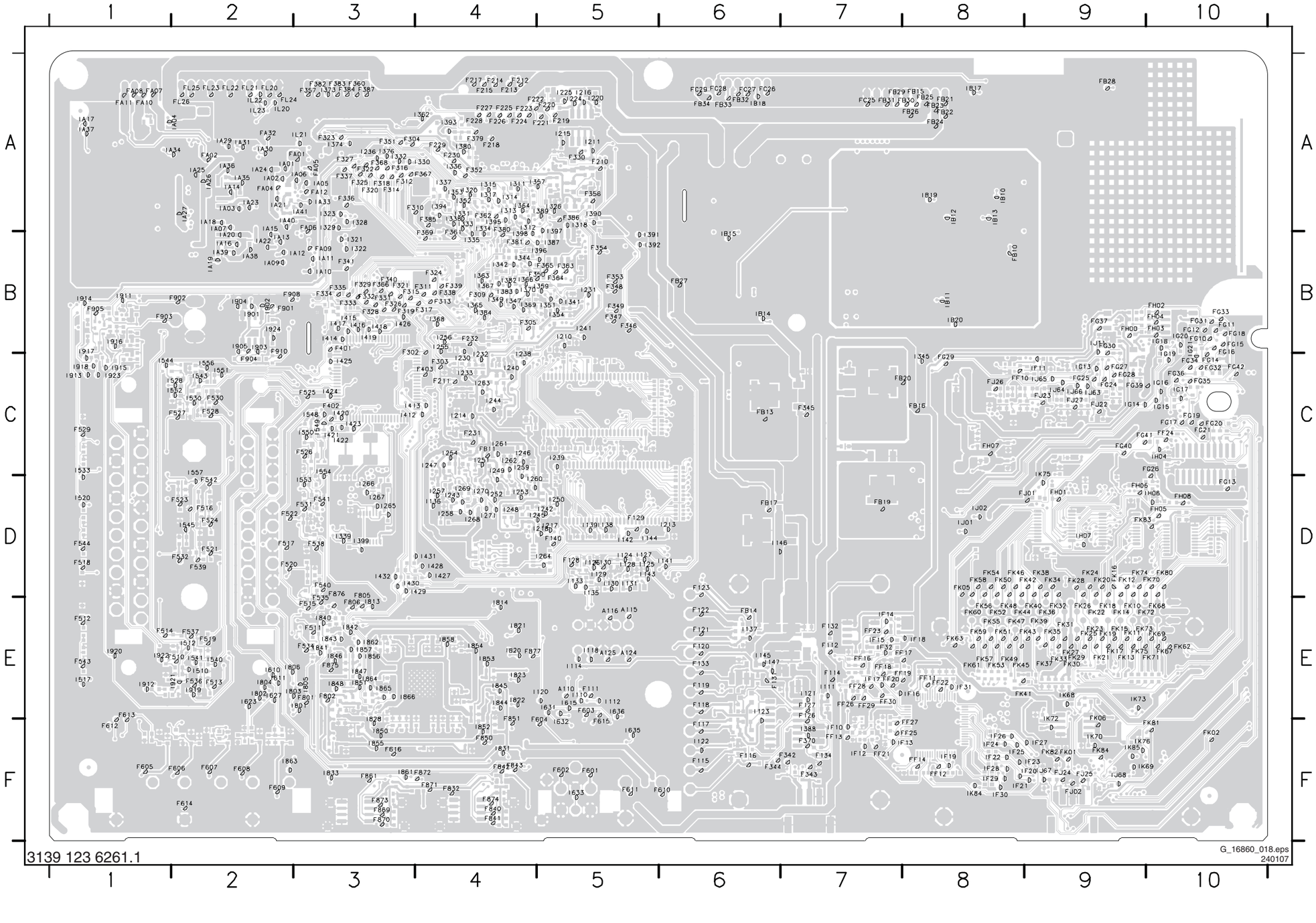
I822 E4 IF19 F8
I823 E4 IF20 F9
I828 F3 IF21 F8



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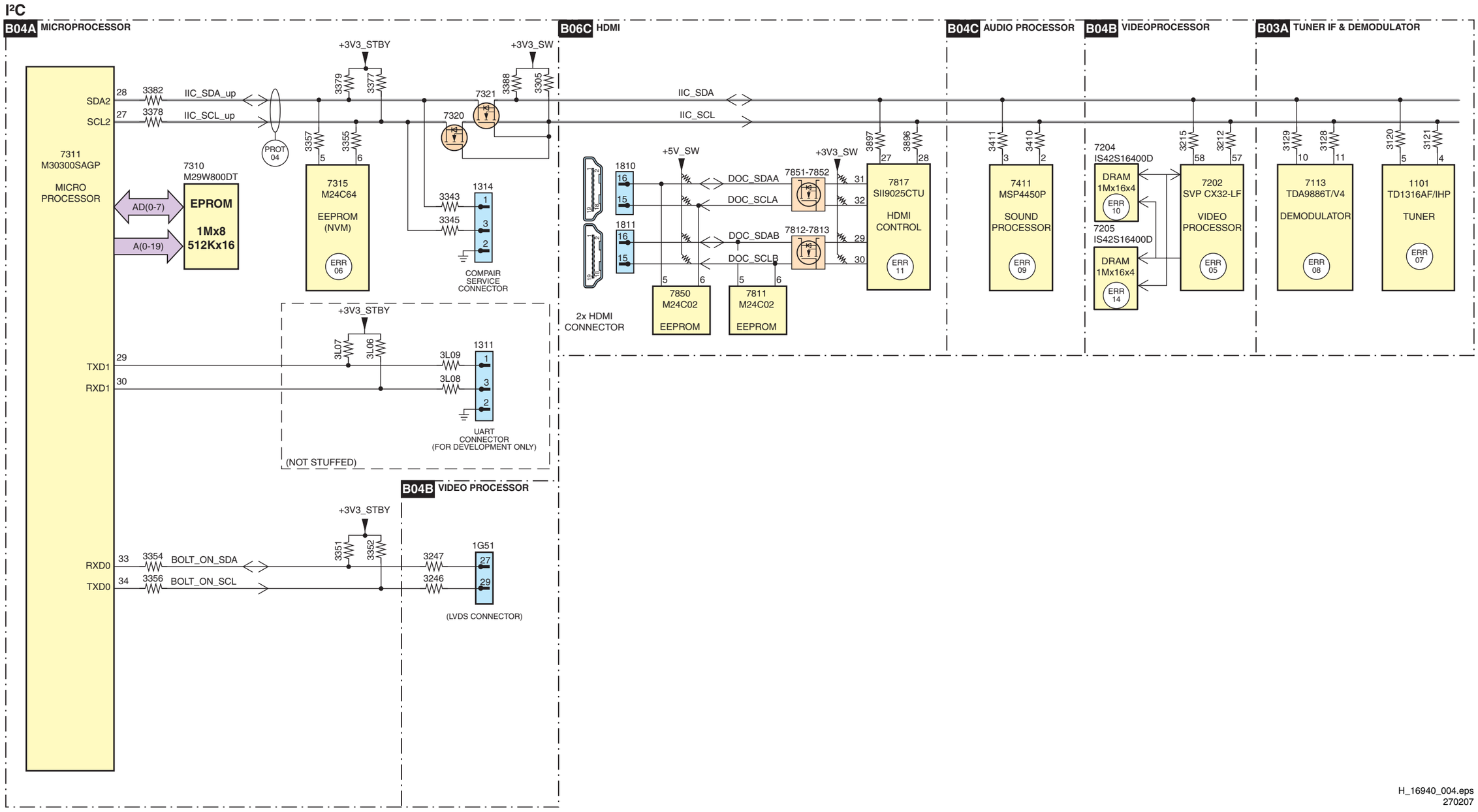
I2C IC's Overview



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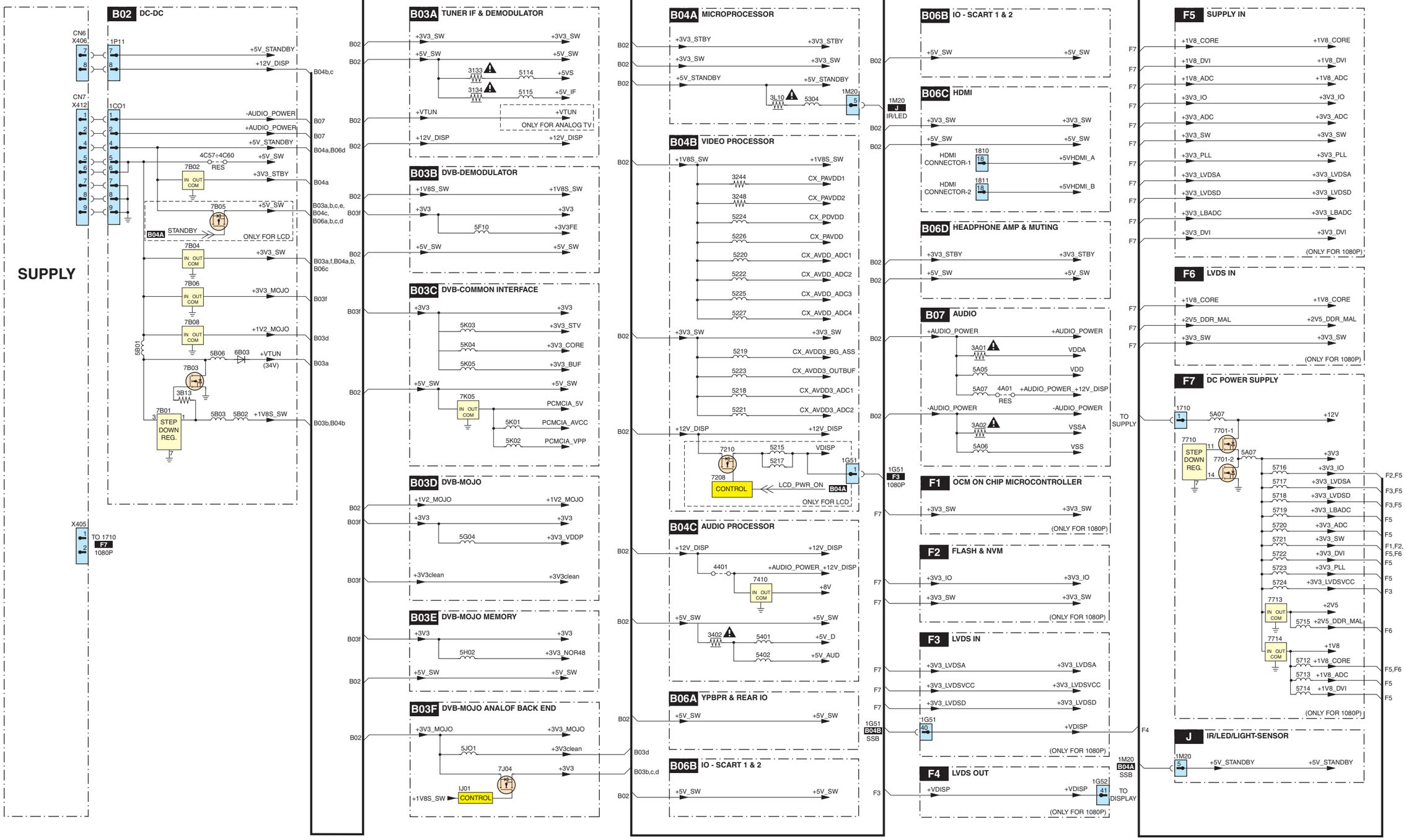
Supply Lines Overview

SUPPLY LINES OVERVIEW

SUPPLY



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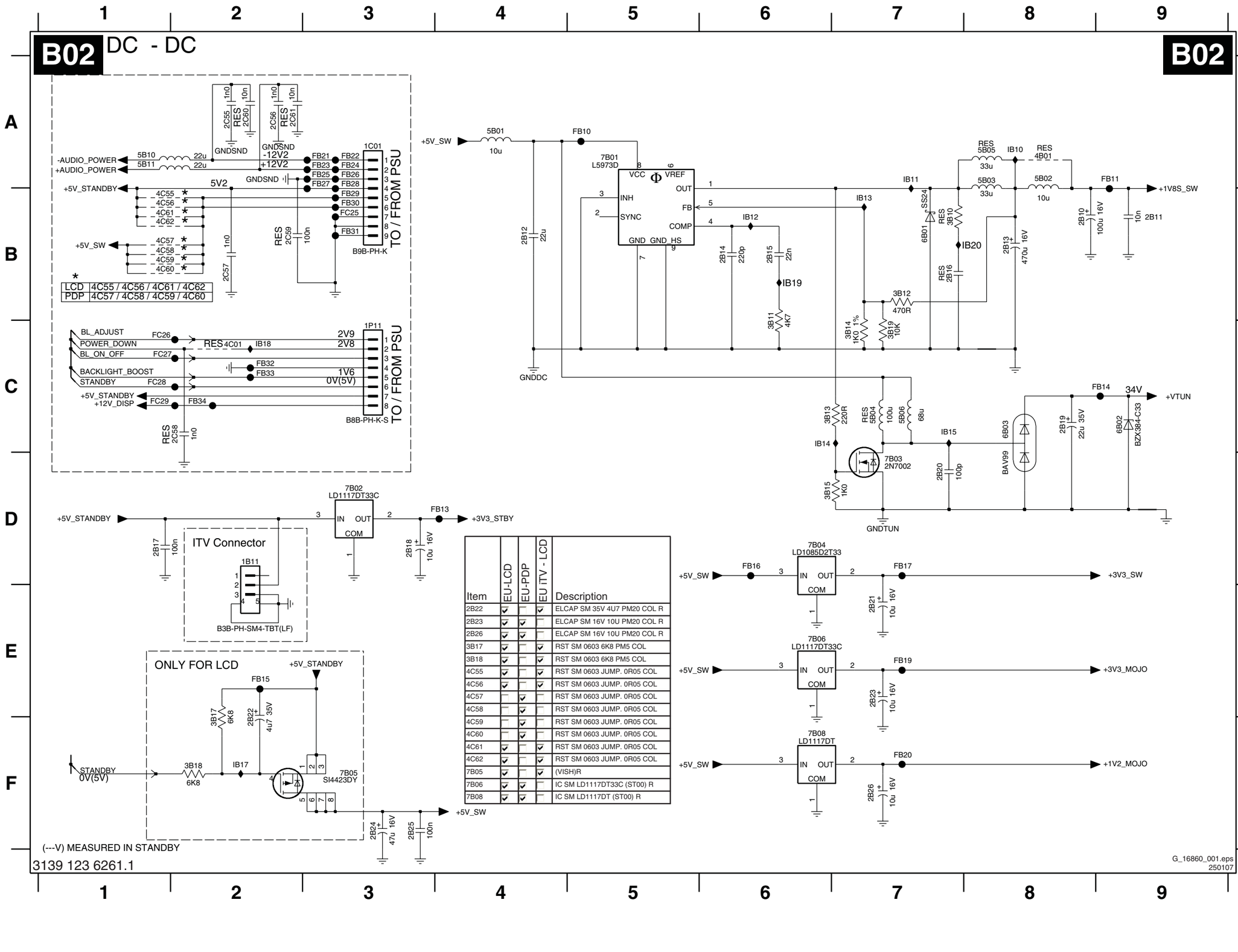
7. Circuit Diagrams and PWB Layouts

SSB: DC/DC



Item	EU-LCD	EU-PDP	EU iTV - LCD	Description
2B22	✓		✓	ELCAP SM 35V 4U7 PM20 COL R
2B23	✓	✓		ELCAP SM 16V 10U PM20 COL R
2B26	✓	✓		ELCAP SM 16V 10U PM20 COL R
3B17	✓		✓	RST SM 0603 6K8 PM5 COL
3B18	✓		✓	RST SM 0603 6K8 PM5 COL
4C55	✓		✓	RST SM 0603 JUMP. 0R05 COL
4C56	✓		✓	RST SM 0603 JUMP. 0R05 COL
4C57		✓		RST SM 0603 JUMP. 0R05 COL
4C58		✓		RST SM 0603 JUMP. 0R05 COL
4C59		✓		RST SM 0603 JUMP. 0R05 COL
4C60		✓		RST SM 0603 JUMP. 0R05 COL
4C61	✓		✓	RST SM 0603 JUMP. 0R05 COL
4C62	✓		✓	RST SM 0603 JUMP. 0R05 COL
7B05	✓		✓	(VISH)R
7B06	✓	✓		IC SM LD1117DT33C (ST00) R
7B08	✓	✓		IC SM LD1117DT (ST00) R

1B11 D2 FB24 A3
1C01 A3 FB25 A3
1P11 C3 FB26 A3
2B10 B8 FB27 A3
2B11 B9 FB28 A3
2B12 B4 FB29 B3
2B13 B8 FB30 B3
2B14 B6 FB31 B3
2B15 B6 FB32 C2
2B16 B7 FB33 C2
2B17 D1 FB34 C2
2B18 D3 FC25 B3
2B19 C8 FC26 C1
2B20 D7 FC27 C1
2B21 E7 FC28 C1
2B22 F2 FC29 C1
2B23 E7 IB10 A8
2B24 F3 IB11 A7
2B25 F3 IB12 B6
2B26 F7 IB13 B7
2C55 A2 IB14 C6
2C56 A2 IB15 C7
2C57 B2 IB17 F2
2C58 C2 IB18 C2
2C59 B2 IB19 B6
2C60 A2 IB20 B8
2C61 A2
3B10 B7
3B11 C6
3B12 B7
3B13 C6
3B14 C7
3B15 D6
3B17 F2
3B18 F2
3B19 C7
4B01 A8
4C01 C2
4C55 B1
4C56 B1
4C57 B1
4C58 B1
4C59 B1
4C60 B1
4C61 B1
4C62 B1
5B01 A4
5B02 A8
5B03 A8
5B04 C7
5B05 A8
5B06 C7
5B10 A1
5B11 A1
6B01 B7
6B02 C9
6B03 C8
7B01 A5
7B02 D3
7B03 D7
7B04 D6
7B05 F3
7B06 E6
7B08 F6
FB10 A5
FB11 A9
FB13 D4
FB14 C9
FB15 E2
FB16 D6
FB17 D7
FB19 E7
FB20 F7
FB21 A3
FB22 A3
FB23 A3

SSB: Tuner & Demodulator

B03A TUNER IF & DEMODULATOR

B03A

SAW FILTERS

A110 ★4110 I110 ★4111 F111
IF_ATV 3113 47R 2110 220p 2111 I112 68p 2114 3p3
5111 390n 5110
40.4MHz Trap
3113/4110 & 2110/4111 at same position
RESERVED
1102 OFWK3953M 38M9 A115 A116 5117 RES VIF1 VIF2
+5V_IF 3116 6K8 2117 10n I114 3117 2K2 6103 1SS356 I118
1103 OFWK9856M 38M9 A124 A125 5113 RES SIF2 SIF1
+5V_IF 3118 2K2
SAW_SW I141 3119 22K I120 3122 18K 7109 BC847B

TUNER

+12V_DISPLAY 5118 220R I146 3136 47R I147 3137 47R
7133 L78M05CDT IN OUT COM
★1101 TUNER F112 ★4112 F132 TUNER TD1316AF/IHP-2 F134
2147 330n 2148 100n I145 4V9
ONLY FOR ANALOG TV +VTUN 3130 1K0 ★4113 I137 2119 100n 2142 10u 50V RES 2151 10u 50V
5112 220R F133 2120 22u 2118 10n 4V3
2146 1u0 F113 F114 F115 F116 F117 F118 F119 F120 F121 F122 F123
★4114 ★4115 ★4116 ★4117 ★4118 ★4119 F126 F127
1V3 I122 ★4120 1V3
5120 120R RES 3120 10R I121 2122 15p ★4123
5121 120R RES 3121 10R I123 2121 15p

DVB ONLY

+5V_IF 2113 10n 7111 74HCT4053D VDD MDX G4
4X1 4X2 VSS VEE
★4125
RF_AGC_IBO WAGC_SW DVB_SW IIC_SDA I2C_TDA_SDA IIC_SCL I2C_TDA_SCL
VIM_IBO IF_AGC_IBO VIP_IBO IF_ATV 4MHZ_CLK
★4121 +5V_IF RES 3131 4K7 RES 7131 BSH111 +3V3_SW
★4122 +5V_IF RES 3132 4K7 RES 7132 BSH111 +3V3_SW

3111 5K6 RF_AGC
+5V_IF 3110 8K2 6110 BAS316 I111 2112 10u 2149 2u2 3115 39K

DEMODULATOR

RF_AGC 3124 100R RES 2124 22n F128 2125 470n I124 3123 330R 2123 1n5 I125 2126 220n I126 I127
1104 4M0 2127 22p 2143 1n0 I142
7113 TDA9886T/V4 TOP TAGC VAGC VPLL REF AFC
TUNER AGC | VIF AGC | RC VCO | DIGITAL VCO CONTROL | AFC DETECTOR
VIF2 2V 2 VIF2 VIF1 2V 1 VIF1
SIF2 2V 24 SIF2 SIF1 2V 23 SIF1
VIF-PLL
SINGLE REFERENCE QSS MIXER INTERCARRIER MIXER AND AM-DEMODULATOR
SOUND TRAPS 4,5 to 6.5 Mhz CVBS 17 F130 2V1
AUDIO PROCESSING AND SWITCHES AUD 8 DEEM 5 I128 2133 10n
NARROW-BAND FM-PLL DEMODULATOR AFD 6 I129 2136 470n
MAD
SUPPLY SIF AGC OUTPUT PORTS I²C-BUS TRANSCEIVER
20 Vp 18 AGND 13 NC 3 OP1 22 OP2 11 SCL 10 SDA 7 DGND 12 SIOMAD 4 FMPLL
+5VS 2138 10n I143 1n0 I144 10n 2145 2144 3128 100R RES 2140 I133
IIC_SCL IIC_SDA 3129 100R 2141 RES I135 I136 SIF
2V1 2V3 I131 2137 10n I130 3127 5K6 2139 390p
+5VS 3135 15R 2128 10n 7114 BC847B 1V5 I138 ★4124
3125 150R I139 5116 5u6 F140 CVBS_RF
3126 180R 2134 15p 2135 15p RES

★	ANALOG	DIGITAL
4110	Y	Y
4111	Y	Y
4112	Y	Y
4113	Y	▬
4114	Y	▬
4115	▬	Y
4116	▬	Y
4117	▬	Y
4118	▬	Y
4119	▬	Y
4120	Y	▬
4121	Y	▬
4122	Y	▬
4123	Y	Y
4124	Y	Y

+5V_SW F114 3133 1R0 5114 10u F129 +5VS 2129 22u 2130 10n
+5V_SW 3134 1R0 5115 10u F131 +5V_IF 2131 22u 2132 22u

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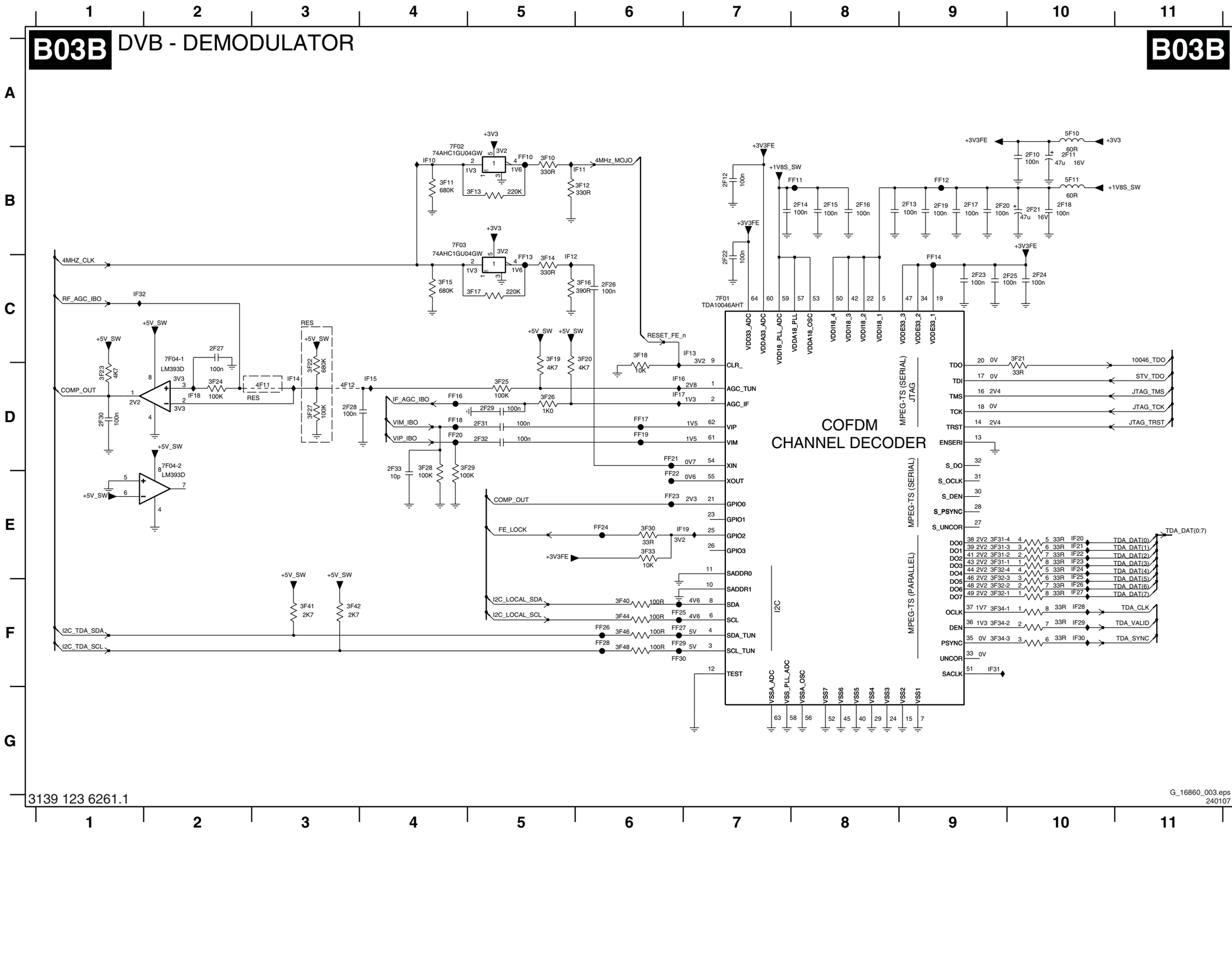
1101 A6 A110 B1
1102 B4 A115 B5
1103 C4 A116 B5
1104 E4 A124 C5
2110 B2 A125 C5
2111 B2 F111 B3
2112 B11 F112 B6
2113 B10 F114 H10
2114 B2 F115 B7
2115 B6 F116 B7
2116 B6 F117 B7
2117 C3 F118 B7
2118 C10 F119 B7
2119 C8 F120 B7
2120 C9 F121 B7
2121 E7 F122 B7
2122 D7 F123 B7
2123 F3 F126 C7
2124 F2 F127 C7
2125 F3 F128 F2
2126 F3 F129 H11
2127 F5 F130 G6
2128 F7 F131 H11
2129 H11 F132 B6
2130 H11 F133 B9
2131 I11 F134 A8
2132 I11 F140 G8
2133 G6 I110 B2
2134 H7 I111 A12
2135 H8 I112 B3
2136 H6 I114 C4
2137 H5 I118 C4
2138 H2 I120 D2
2139 H5 I121 D10
2140 I3 I122 D7
2141 I3 I123 E10
2142 C9 I124 E3
2143 F5 I125 F4
2144 I3 I126 F3
2145 I3 I127 F3
2146 B6 I128 G6
2147 A8 I129 G6
2148 A9 I130 H6
2149 B11 I131 H5
2151 C9 I133 I4
3110 A12 I135 I4
3111 A11 I136 I4
3113 B2 I137 B8
3115 B12 I138 G7
3116 B3 I139 G7
3117 C3 I141 D1
3118 D2 I142 F5
3119 D1 I143 H3
3120 D8 I144 H4
3121 E8 I145 A9
3122 D2 I146 A8
3123 E3 I147 A8
3124 E2
3125 G7
3126 H7
3127 H6
3128 I4
3129 I3
3130 B8
3131 D10
3132 E10
3133 H10
3134 H10
3135 F7
3136 A8
3137 A9
4110 B2
4111 B2
4112 B6
4113 B8
4114 C7
4115 C7
4116 C7
4117 C7
4118 C7
4119 C7
4120 D8
4121 D10
4122 E10
4123 D7
4124 G8
4125 B11
5110 B2
5111 B1
5112 B9
5113 C5
5114 H11
5115 H11
5116 G8
5117 B5
5118 A8
5120 D8
5121 E8
6103 C3
6110 A11
7109 D2
7111 B10
7113 F2
7114 G7
7131 D11
7132 E11
7133 A8

SSB: DVB - Demodulator (Not implemented in this chassis)

B03B DVB - DEMODULATOR



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2F11 B10 FF26 F6
2F12 B7 FF27 F6
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2F14 B8 FF29 F6
2F15 B8 FF30 F6
2F16 B8 IF10 B4
2F17 B9 IF11 B6
2F18 B10 IF12 C5
2F19 B9 IF13 C7
2F20 B9 IF14 D3
2F21 B10 IF15 D4
2F22 C7 IF16 D6
2F23 C9 IF17 D6
2F24 C10 IF18 D2
2F25 C10 IF19 E6
2F26 C6 IF20 E10
2F27 C2 IF21 E10
2F28 D3 IF22 E10
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FF14 C9
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FF17 D6
FF18 D4
FF19 D6
FF20 D4
FF21 D6
FF22 E6
FF23 E6
FF24 E6

SSB: DVB - Common Interface (Not implemented in this chassis)

B03C DVB-COMMON INTERFACE

B03C

PCMCIA CONTROLLER

I²C INTERFACE

TS INTERFACE

INTERRUPTS MANAGEMENT

UCSG

CURRENT SWITCH

LATCH 7K01 74LVC573ADB

LATCH 7K02 74LVC573ADB

BUS TRANSCEIVER 7K03 74LVC245A

68p PCMCIA CONNECTOR

3139 123 6261.1

G_16860_004.eps 240107

1K00-A H7	FK45 J8
1K00-B H8	FK46 J7
2K00 H4	FK47 J8
2K01 I4	FK48 J7
2K02 H15	FK49 J8
2K03 H15	FK50 J7
2K04 J2	FK51 J8
2K05 G15	FK52 J7
2K06 H15	FK53 J8
2K07 F14	FK54 J7
2K08 H15	FK55 J8
2K09 H15	FK56 J7
2K10 H15	FK57 J8
2K11 I15	FK58 J7
2K12 I15	FK59 J8
2K13 I15	FK60 J7
2K14 F9	FK61 J8
2K15 K4	FK62 J8
2K16 F8	FK63 J7
2K17 G8	FK67 H8
3K00 F2	FK68 H7
3K01 F2	FK69 H8
3K02-1 F4	FK70 H7
3K02-2 F4	FK71 H8
3K02-3 F4	FK72 H7
3K03-1 F5	FK73 H8
3K03-2 F5	FK74 H7
3K03-3 F5	FK75 H8
3K03-4 F5	FK80 H7
3K04 H9	FK81 H15
3K05-1 F5	FK82 I15
3K05-2 F5	FK83 I15
3K05-3 F5	FK84 E15
3K05-4 F6	IK68 C10
3K06 J9	IK69 C10
3K07 J9	IK70 F15
3K08 J6	IK72 F16
3K09 F9	IK73 C10
3K10 E14	IK75 F11
3K11 F16	IK76 C11
3K12 F10	IK84 F8
3K13 F14	IK85 C4
3K15 B9	
3K16 B9	
3K17 B9	
3K18 B9	
3K19 B9	
3K20 B9	
3K21 B9	
3K22 B9	
3K23-1 K4	
3K23-2 K4	
3K23-3 K4	
3K23-4 K4	
3K24-1 K4	
3K24-2 K4	
3K24-3 K4	
3K24-4 K4	
3K25 J4	
3K26 K4	
3K27 B2	
3K28 B2	
3K29 B3	
3K30 B3	
3K31 B3	
3K32 B3	
3K33 B3	
3K34-1 B3	
3K34-2 C3	
3K34-3 C4	
3K34-4 C4	
3K38 B4	
3K39 B4	
3K40 B4	
3K41 B5	
3K42 B5	
3K43 B5	
3K44 B5	
3K45 B5	
3K46 B5	
3K47 B5	
3K48 B6	
3K49 H2	
3K50 H2	
3K51 J6	
3K52 B4	
5K01 G14	
5K02 H14	
5K03 H14	
5K04 I14	
5K05 I14	
7K00 E1	
7K01 H3	
7K02 I3	
7K03 J3	
7K04 F8	
7K05 E15	
FK01 E9	
FK02 E10	
FK05 F9	
FK06 F14	
FK10 H7	
FK11 H8	
FK12 H7	
FK13 H8	
FK14 H7	
FK15 H8	
FK16 H7	
FK17 H8	
FK18 I7	
FK19 I8	
FK20 I7	
FK21 I8	
FK22 I7	
FK23 I8	
FK24 I7	
FK25 I8	
FK26 I7	
FK27 I8	
FK28 I7	
FK29 I8	
FK30 I7	
FK31 I7	
FK32 I7	
FK33 I8	
FK34 I7	
FK35 I8	
FK36 I7	
FK37 I8	
FK38 I7	
FK39 I8	
FK40 I7	
FK41 I8	
FK42 I7	
FK43 I8	
FK44 J7	

SSB: DVB - Mojo (Not implemented in this chassis)

B03D DVB-MOJO

B03D

POWER ON RESET

FOR DEV. ONLY

FOR DVE. ONLY

4G05 FOR DEVELOPMENT ONLY
4G01, 4G02, 4G03,4G04 FOR PRODUCTION

PRO. FOR USB

(JTAG-ETAG-SYS)

(TS)

(AV)

(I2C-USB-SCO)

(PWR)

(SDRAM)

(GPIO)

(MIU)

3139 123 6261.1

G_16860_005.eps
240107

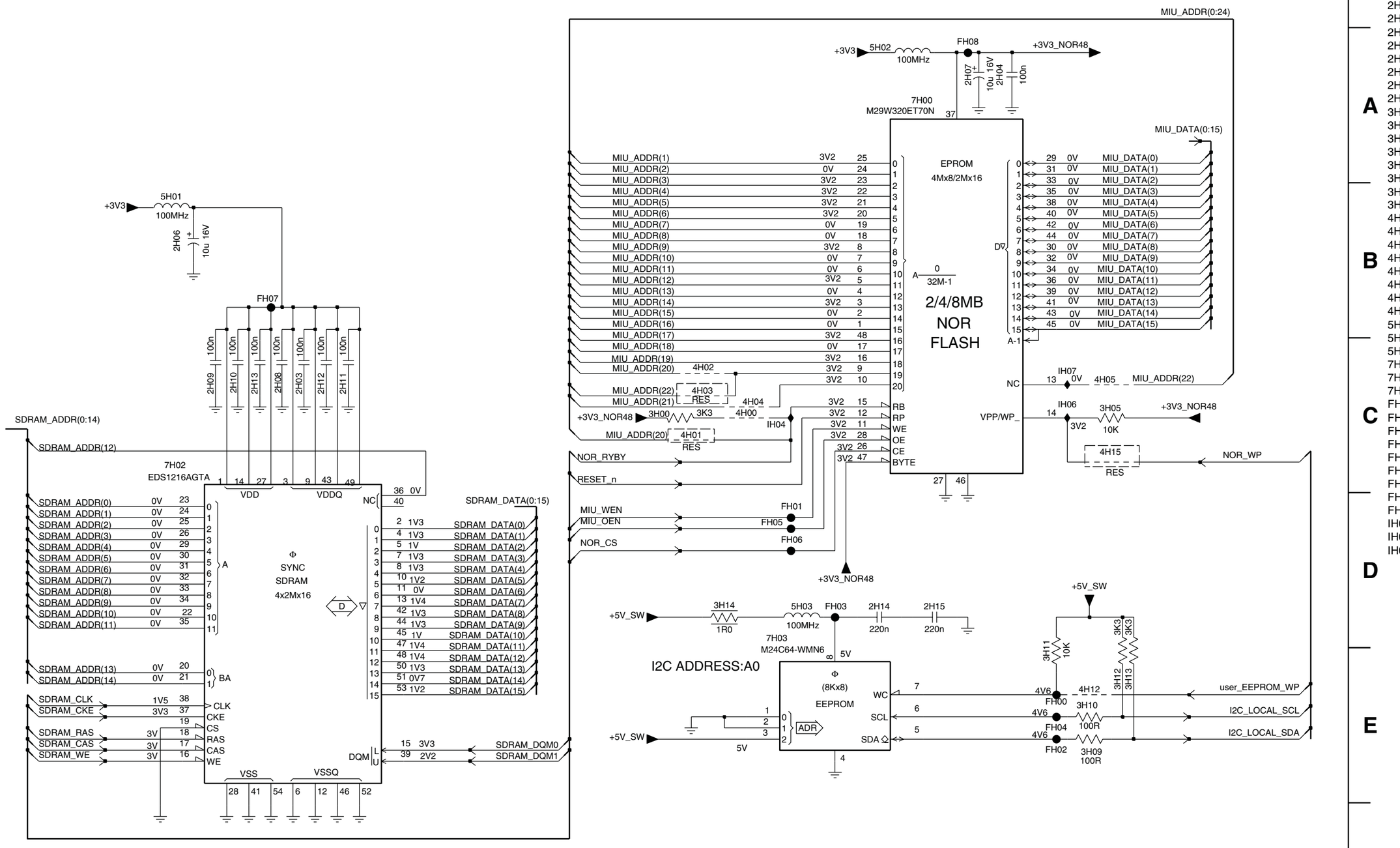
1G01-1 A8
1G01-2 A9
1G03 D2
1G04 I1
2G02 G5
2G03 G6
2G04 G6
2G05 G6
2G06 H6
2G07 H6
2G08 H6
2G09 H6
2G10 H6
2G11 H6
2G12 F6
2G13 G6
2G14 G6
2G15 G6
2G16 G6
2G17 G6
2G18 G6
2G19 H9
2G20 I9
2G21 I9
2G22 H6
2G23 I6
2G24 I6
2G31 B4
2G32 C5
2G33 C5
2G34 D1
3G11 E6
3G12 E9
3G15 A4
3G16 A4
3G17 A4
3G18 A4
3G19 A4
3G20 A4
3G28 E14
3G29 F14
3G30 E14
3G31 E14
3G33 G2
3G34 G2
3G35 F2
3G36 F14
3G37 F14
3G38 A4
3G40 I8
3G41 E14
3G43 H2
3G44 H2
3G46 H2
3G47 I2
3G48 C6
3G51 G13
3G54 G13
3G55 G13
3G56-1 H10
3G56-2 H10
3G56-3 H10
3G56-4 H10
3G57-1 G10
3G57-2 H10
3G57-3 G10
3G57-4 H10
3G58-1 G10
3G58-2 H10
3G58-3 G10
3G58-4 H10
3G59-1 H10
3G59-2 H10
3G59-3 H10
3G59-4 H10
3G60 I11
3G61 I11
3G62 I11
3G63 F10
3G65 C2
4G01 B9
4G02 B9
4G03 B9
4G04 C8
4G05 C8
4G09 A2
4G10 A2
4G31 C4
5G01 F5
5G02 G5
5G03 C4
5G04 I6
7G00-1 F7
7G00-2 E3
7G00-3 F3
7G00-4 A12
7G00-5 G12
7G00-6 H4
7G00-7 D12
7G00-8 D7
7G06 C1
FG10 A7
FG11 A7
FG12 A7
FG13 A9
FG14 A7
FG15 A7
FG16 A7
FG17 H2
FG18 C6
FG19 H2
FG20 E13
FG21 E13
FG22 E13
FG23 E13
FG24 E14
FG25 E14
FG26 E9
FG27 F14
FG28 F13
FG29 F13
FG30 F13
FG31 H2
FG32 H3
FG33 H2
FG34 H3
FG35 H3
FG36 I3
FG37 C5
FG39 F6
FG40 A7
FG41 A7
FG42 C1
IG13 I8
IG14 F1
IG15 G1
IG16 G1
IG17 F11
IG18 F2
IG19 G2
IG20 G2
IG21 E6

SSB: DVB - Mojo Memory (Not implemented in this chassis)

B03E DVB-MOJO MEMORY

B03E

2H03 C2
2H04 A7
2H06 B1
2H07 A6
2H08 C2
2H09 C2
2H10 C2
2H11 C2
2H12 C2
2H13 C2
2H14 D6
2H15 D6
3H00 C4
3H05 C7
3H09 E7
3H10 E7
3H11 E7
3H12 E7
3H13 E7
3H14 D5
4H00 C5
4H01 C5
4H02 C5
4H03 C5
4H04 C5
4H05 C7
4H12 E7
4H15 C7
5H01 B1
5H02 A6
5H03 D5
7H00 A6
7H02 C1
7H03 D5
FH00 E7
FH01 D5
FH02 E7
FH03 D6
FH04 E7
FH05 D5
FH06 D5
FH07 B2
FH08 A6
IH04 C5
IH06 C7
IH07 C7

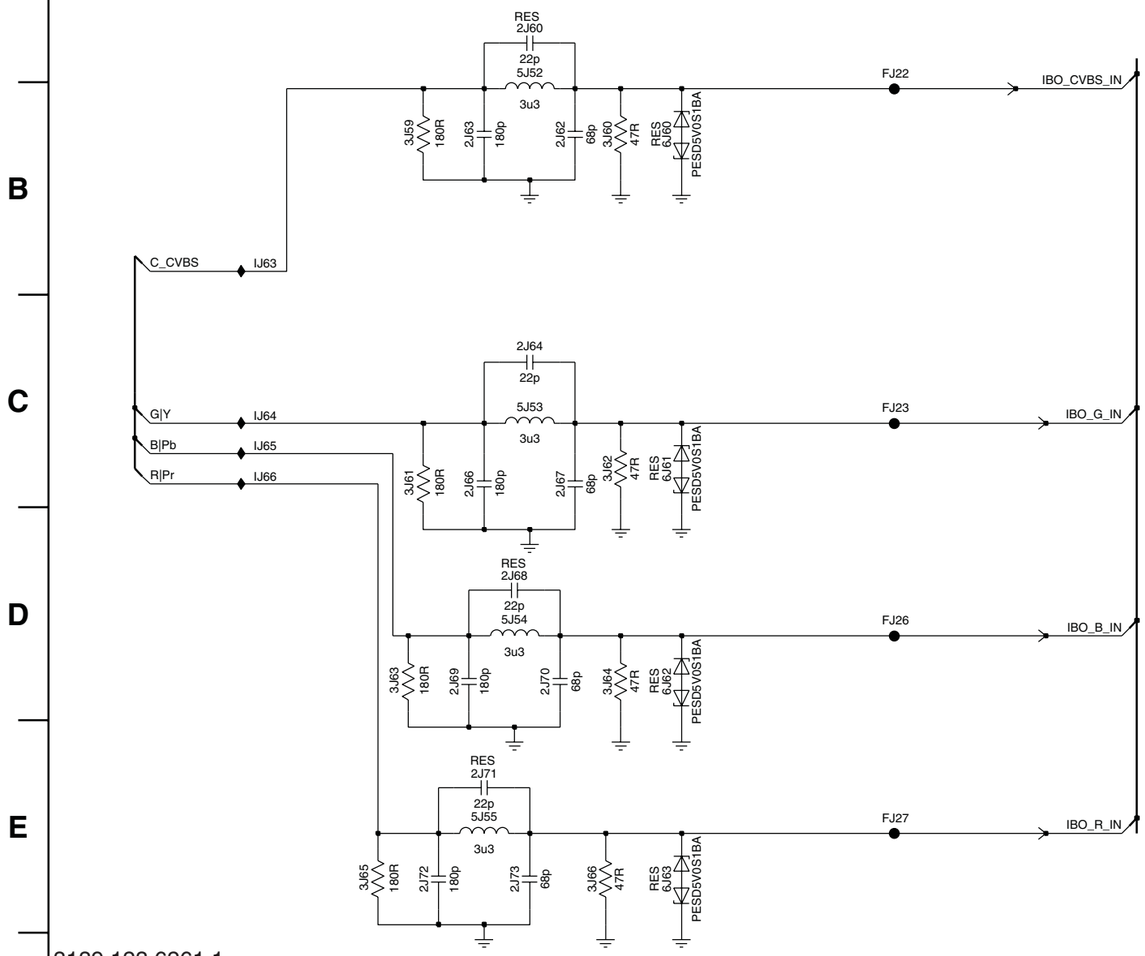


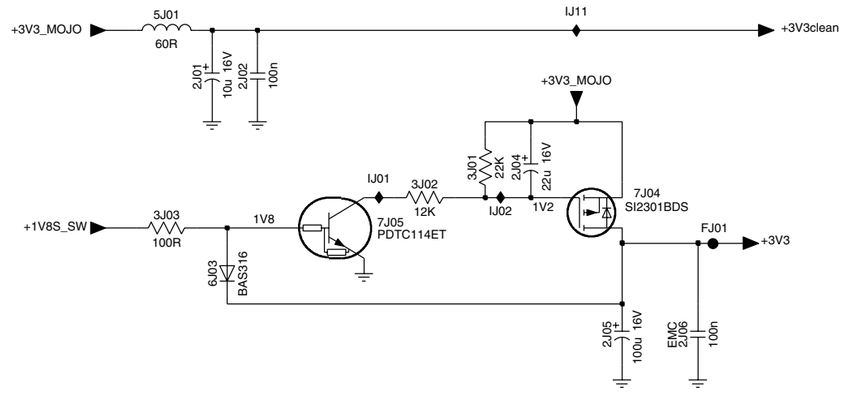
3139 123 6261.1

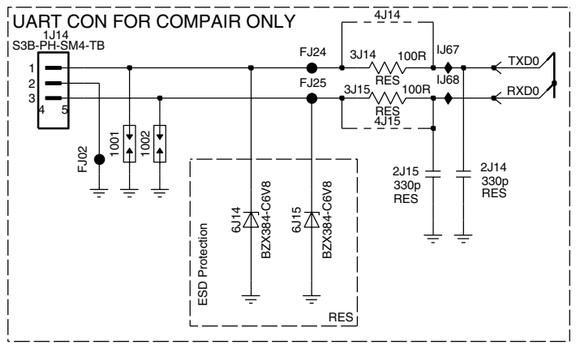
G_16860_006.eps
240107

SSB: DVB - Mojo Analog Back End (Not implemented in this chassis)

B03F DVB-MOJO ANALOG BACK END







3139 123 6261.1

G_16860_007.eps
240107

1001 D7 IJ66 C1
1002 D7 IJ67 D8
1J14 D6 IJ68 D8
2J01 B7
2J02 B7
2J04 B8
2J05 C8
2J06 C9
2J14 D8
2J15 D8
2J60 A2
2J62 B3
2J63 B2
2J64 C2
2J66 C2
2J67 C3
2J68 D2
2J69 D2
2J70 D3
2J71 E2
2J72 E2
2J73 E2
3J01 B8
3J02 B8
3J03 B6
3J14 D8
3J15 D8
3J59 B2
3J60 B3
3J61 C2
3J62 C3
3J63 D2
3J64 D3
3J65 E2
3J66 E3
4J14 D8
4J15 D8
5J01 A6
5J52 A2
5J53 C2
5J54 D2
5J55 E2
6J03 C7
6J14 D7
6J15 D8
6J60 B3
6J61 C3
6J62 D3
6J63 E3
7J04 B9
7J05 B7
FJ01 B9
FJ02 D6
FJ22 A4
FJ23 C4
FJ24 D8
FJ25 D8
FJ26 D4
FJ27 E4
IJ01 B7
IJ02 B8
IJ11 A8
IJ63 B1
IJ64 C1
IJ65 C1

SSB: Micro Processor

B04A MICROPROCESSOR

Item	ITV	with Side AV	Other region	Description
1304				CON V 11P M 2.00 PH B
1312				CON V 10P M 2.00 SM PH R
1315				CON V 6P M 2.00 PH B
1M20				CON V 7P M 2.00 PH B
2321				CER1 0603 NP0 50V 22P COL
2322				CER1 0603 NP0 50V 22P COL
3320				RST SM 0603 100R PM5 COL
3322				RST SM 0603 100R PM5 COL
3351				RST SM 0603 3K3 PM5 COL
3352				RST SM 0603 3K3 PM5 COL
3354				RST SM 0603 100R PM5 COL
3356				RST SM 0603 100R PM5 COL
3370				RST SM 0603 100R PM5 COL
3L08				RST SM 0603 100R PM5 COL
3L09				RST SM 0603 100R PM5 COL
3L10				RST SM FUSE 1206 1R PM5 R
3L12				RST SM 0603 10K PM5 COL
3L13				RST SM 0603 10K PM5 COL
4L09				RST SM 0603 JUMP. 0R05 COL

TO / FROM SIDE IO

TO / FROM IR/ LED & KEYBOARD

ITV_Connector A:

COMPAIR

EPROM 1Mx8/512Kx16

EEPROM (8Kx8)

UART CON For Development only

3139 123 6261.1

G_16860_008.eps 250107

1301 B3	3376 D6	F341 E11
1302 I2	3377 E7	F342 I2
1303 I2	3378 F7	F343 I2
1304 A9	3379 E7	F344 I3
1305 I9	3380 D5	F345 G10
1306 H8	3381 G2	F346 H5
1307 I8	3382 E7	F347 I5
1308 I8	3383 F2	F348 I5
1309 I8	3384 H2	F349 I5
1310 I9	3385 H2	F350 F8
1311 H7	3386 H2	F351 I5
1312 H5	3387 E5	F352 I5
1314 I3	3388 E5	F353 I5
1M20 H8	3389 I11	F354 I5
2310 A4	3390 I11	F356 E8
2311 C13	3391 I11	F357 H8
2312 A4	3392 I11	F360 I9
2313 A4	3393 E1	F361 D3
2314 B3	3394 D1	F362 C5
2315 B1	3395 E2	F363 G11
2316 B3	3396 C7	F364 G11
2317 B2	3397 E5	F365 G11
2318 C3	3398 E2	F366 E11
2319 E11	3399 E2	F367 E11
2320 F9	3L01 G6	F368 C13
2321 G7	3L02 H5	F369 E11
2322 G7	3L04 E2	F370 G6
2323 G1	3L05 B5	F379 D2
2324 F7	3L06 H6	F380 B3
2325 F8	3L07 H7	F381 B3
2326 E8	3L08 H5	F382 I10
2327 H9	3L09 H5	F383 I10
2328 I10	3L10 H11	F384 I10
2329 I10	3L11 C7	F385 D3
2330 I10	3L12 G7	F386 C5
2331 I10	3L13 G7	F387 I10
2332 I12	3L14 G9	FL20 A9
2333 I10	3L15 F1	FL21 A9
2334 I11	3L20 A11	FL22 A9
2335 I11	3L21 A11	FL23 A9
2336 I11	3L22 B11	FL24 A9
2337 I12	3L23 B11	FL25 A9
2338 E2	3L24 A11	FL26 A9
2339 I12	3L25 A11	I311 B5
2340 I10	3L26 D5	I312 B3
2L20 A10	4301 F6	I313 B5
2L21 A10	4302 H11	I314 B5
2L22 A11	4303 H12	I315 B5
2L23 A11	4306 G12	I317 B5
2L24 A12	4307 G12	I318 G9
2L25 A12	4308 H5	I320 C5
2L26 B10	4309 I12	I321 D10
2L27 B10	4310 I11	I322 D10
2L28 B11	4313 H6	I323 D10
2L29 B11	4314 H11	I326 C5
2L30 B10	4315 H11	I328 D10
2L31 B10	4316 G9	I329 E9
2L32 B11	4323 F1	I330 D1
2L33 B11	4324 D2	I331 D3
3300 C1	4325 D2	I332 D1
3303 B5	4L20 A11	I333 D3
3304 D6	4L21 A11	I334 D1
3305 G12	4L24 A11	I335 D3
3306 F7	4L25 A11	I336 D5
3307 G7	5301 A4	I337 D1
3308 G12	5302 C13	I338 D3
3309 G12	5304 I11	I339 D1
3310 B6	6301 B2	I341 D5
3311 B5	6302 D10	I342 D5
3312 B5	6303 E10	I344 D5
3313 B5	6304 E10	I345 E5
3314 B3	6305 F9	I347 G6
3315 B5	6306 I2	I349 G6
3316 B2	6307 I2	I351 F5
3317 B5	6308 H8	I352 D3
3318 B3	6309 I8	I353 D1
3319 B2	6310 I8	I354 F5
3320 B5	6311 I9	I357 C5
3321 B3	6312 I9	I359 G5
3322 B5	6313 I9	I362 D6
3323 B3	6317 D1	I363 G5
3324 C5	6318 E2	I364 D5
3325 C1	7308 E1	I365 G3
3326 D11	7310 C12	I366 E6
3327 C5	7311 B3	I367 E6
3328 D10	7312 B1	I368 G3
3329 C5	7313-1 D9	I369 H5
3330 D10	7313-2 C10	I370 H5
3331 C2	7314 F6	I373 I10
3332 D2	7315 F10	I374 I11
3333 C1	7316 F2	I376 I12
3334 C2	7317 E1	I380 E1
3335 C2	7320 H11	I382 G5
3336 E11	7321 H12	I383 H5
3337 E9	7322 C7	I384 H3
3338 D3	7323-1 G1	I387 B3
3339 D3	7323-2 F1	I388 D6
3340 D3	F302 C6	I389 C5
3341 D3	F303 G6	I390 C6
3342 D3	F304 C6	I391 H6
3343 I1	F305 F5	I392 H6
3344 D5	F309 H5	I393 E2
3345 I1	F310 C11	I394 E2
3346 D5	F311 C11	I395 B5
3347 D5	F312 C13	I396 E5
3348 D5	F313 C11	I397 E5
3349 E5	F314 C13	I398 E5
3350 E5	F315 C11	I399 D1
3351 G7	F316 C13	IL20 A11
3352 G7	F317 C11	IL21 A12
3353 F11	F318 C13	IL22 A11
3354 G7	F319 C11	IL23 A12
3355 G11	F320 C13	
3356 G7	F321 C11	
3357 G11	F322 C13	
3358 F7	F323 B6	
3359 F7	F324 D11	
3360 G5	F325 D13	
3361 F5	F326 D11	
3362 C6	F327 D13	
3363 D2	F328 D11	
3364 D3	F329 D11	
3365 F5	F330 B1	
3366 F5	F331 D11	
3367 F5	F332 D11	
3368 C5	F333 D11	
3369 G5	F334 D11	
3370 G5	F335 D11	
3371 G5	F336 D11	
3372 H2	F337 D13	
3373 G5	F338 D11	
3374 G13	F339 D11	
3375 H2	F340 D11	

SSB: Video Processor

B04B VIDEO PROCESSOR

B04B

VIDEO PROCESSOR

VDISP-SWITCH

LCD

PDP

DISPLAY CONTROL LVDS CONNECTOR

Item	EU LCD	EU PDP	EU/US LCD+ITV	AP/CH/LT LCD	AP/CH/LT PDP	Description
1217				✓	✓	FIL CM SM 50V 100MHZ 67R R
1218				✓	✓	FIL CM SM 50V 100MHZ 67R R
2207			✓	✓		CER2 0603 X7R 16V 100N COL
2208			✓	✓		ELCAP SM SEV 25V 100U PM20 R
				✓		ELCAP SM 16V 100U PM20 COL R
2209			✓	✓		ELCAP SM SEV 25V 100U PM20 R
				✓		ELCAP SM 16V 100U PM20 COL R
2210			✓	✓		CER2 0603 X7R 16V 100N COL
2248			✓	✓		CER2 0805 X7R 16V 1U PM10 R
2267			✓	✓		CER2 0603 X7R 16V 100N COL
2294			✓	✓		CER2 0603 X7R 16V 100N COL
3213			✓	✓		RST SM 0603 47K PM5 COL
3216			✓	✓		RST SM 0603 47R PM5 COL
3217			✓	✓		RST SM 0603 47K PM5 COL
3227			✓	✓		RST SM 0603 100R PM5 COL
3233			✓	✓		RST SM 0603 100R PM5 COL
3235			✓	✓		RST SM 0603 100R PM5 COL
3238			✓			RST SM 0603 100R PM5 COL
3241			✓	✓		RST SM 0603 220R PM5 COL
3242			✓	✓		RST SM 0603 4K7 PM5 COL
3243			✓	✓		RST SM 0603 100R PM5 COL
3245			✓	✓		RST SM 0603 10K PM5 COL
3246			✓	✓		RST SM 0603 100R PM5 COL
3247			✓	✓		RST SM 0603 100R PM5 COL
3250			✓	✓		RST SM 0603 22R PM5 COL
3253			✓	✓		RST SM 0603 22R PM5 COL
3254			✓	✓		RST SM 0603 22R PM5 COL
3256			✓	✓		RST SM 0603 22R PM5 COL
3257			✓	✓		RST SM 0603 10K PM5 COL
3258			✓	✓		RST SM 0603 10K PM5 COL
4204			✓	✓		RST SM 0603 JUMP. 0R05 COL
4205			✓	✓		RST SM 0603 JUMP. 0R05 COL
4206			✓	✓		RST SM 0603 JUMP. 0R05 COL
4208			✓	✓		IND FXD 0805 EMI 100MHZ 220R R
4209			✓	✓		RST SM 0603 JUMP. 0R05 COL
5215			✓	✓		IND FXD 0805 EMI 100MHZ 220R R
5217			✓	✓		IND FXD 0805 EMI 100MHZ 220R R
6202			✓	✓		DIO REG SM BZX384-C5V6 COL R
7203			✓	✓		TRA SIG SM BC847BW (COL) R
7206			✓	✓		TRA SIG SM BC847BW (COL) R
7208			✓	✓		TRA SIG SM PDTC114ET (COL) R
7210			✓	✓		ES/VISHAY
7211			✓	✓		IC SM 74LCX14T (COL) R

	LGE	SDI	FHP
CTRL-DISP1		RESET Semi standby : H Normal and off : L	
CTRL-DISP2(LCD_PWR_on)	DISPEN On time : H Off time : Don't care		CPU-GO On time : H Off time : Don't care
CTRL-DISP3(Rev_Standby)			PDWIN On time : H Off time : Don't care
CTRL-DISP4			PDP-GO On time : H Semi standby : L Off time : Don't care

1201 D4	3241 K9	I232 E4	
1210 H12	3242 K9	I233 E4	
1211 I12	3243 K9	I236 E15	
1212 I12	3244 A7	I238 J4	
1213 J12	3245 K8	I239 K4	
1214 J12	3246 J14	I240 K8	
1215 L7	3247 J14	I241 K9	
1216 L7	3248 B7	I242 A6	
1G50 H15	3250 J2	I243 A7	
1G51 H17	3251 J3	I244 L8	
2205 K7	3253 K3	I245 A4	
2206 K7	3254 K2	I246 A9	
2207 B17	3255 K3	I247 B7	
2208 B16	3256 L3	I248 A6	
2209 B16	3257 J1	I249 B9	
2210 B17	3258 K1	I250 B4	
2211 C5	3260-1 B12	I251 B7	
2212 C5	3260-2 B12	I252 B9	
2213 C5	3260-3 B12	I253 C9	
2214 C5	3260-4 B12	I254 C7	
2215 C5	3261-1 B12	I255 D2	
2216 D9	3261-2 B12	I256 D2	
2217 B13	3261-3 B12	I257 J4	
2218 B13	3261-4 B12	I258 J4	
2219 B13	3262-1 B12	I259 J10	
2220 B13	3262-2 B12	I260 J10	
2221 B13	3262-3 C12	I261 J10	
2222 B13	3262-4 C12	I262 J10	
2223 B14	3263-1 E12	I263 K8	
2224 E12	3263-2 E12	I264 L3	
2225 E12	3263-3 E12	I265 A3	
2226 E13	3263-4 E12	I266 A2	
2227 E13	3264-1 E12	I267 B3	
2228 E13	3264-2 E12	I268 K6	
2229 B14	3264-3 E12	I269 K7	
2230 C5	3264-4 E12	I270 K7	
2231 C5	3265-1 E12	I271 K8	
2232 C5	3265-2 E12		
2233 D8	3265-3 F12		
2234 D8	3265-4 F12		
2235 D8	3266 C12		
2236 D3	3267 F13		
2237 D4	3268-1 F12		
2238 D4	3268-2 C12		
2239 D4	3268-3 F12		
2240 D4	3268-4 C12		
2241 D4	3271-1 C12		
2242 D4	3271-2 F12		
2243 D5	3271-3 C12		
2244 D5	3271-4 F12		
2245 D8	3272 J9		
2246 D3	3273 A2		
2247 E3	3274 B2		
2248 C15	3275 A3		
2250 F4	3276 B3		
2251 F4	4203 B14		
2252 F4	4204 B15		
2253 F4	4205 B15		
2254 F4	4206 B15		
2255 F4	4207 L9		
2256 F4	4208 E2		
2257 F4	4209 I2		
2258 F4	4210 L6		
2259 F4	4211 L7		
2260 F4	4212 L7		
2261 F4	4213 L8		
2262 F16	4214 B16		
2263 F16	4215 B16		
2264 F16	5210 B4		
2265 F16	5211 A16		
2266 J11	5212 A14		
2267 I8	5213 C9		
2268 I8	5214 C4		
2269 J11	5215 A16		
2270 J11	5216 C3		
2271 J10	5217 B16		
2272 J10	5218 A6		
2273 J3	5219 A4		
2274 J10	5220 A8		
2275 J3	5221 B6		
2276 J3	5222 B8		
2277 J3	5223 B4		
2278 K9	5224 B7		
2279 A7	5225 B8		
2280 A6	5226 C7		
2281 L8	5227 C8		
2282 A9	6228 D13		
2283 K15	6201 C17		
2284 A4	6202 C15		
2285 K15	7202 D4		
2286 B7	7203 L9		
2287 B9	7204 B11		
2288 B6	7205 E11		
2289 B4	7206 K9		
2290 B7	7207 B16		
2291 B9	7208 C15		
2292 C7	7210 A15		
2293 C9	7211-1 J2		
2294 K3	7211-2 K2		
2295 E13	7211-3 K2		
2296 E13	7211-4 L2		
2297 E13	7211-5 L4		
2298 D8	7211-6 L5		
3201-1 I4	7213-1 A3		
3201-2 I4	7213-2 B3		
3201-3 I4	7213-3 B3		
3201-4 I4	7213-4 B3		
3202-1 I4	7213-5 C3		
3202-2 I4	7213-6 C3		
3202-3 I4	7214 A2		
3202-4 I4	F210 A17		
3203-1 I4	F211 C9		
3203-2 I4	F212 E16		
3203-3 I4	F213 E16		
3203-4 I4	F214 E16		
3204-1 J4	F215 E16		
3204-2 J4	F217 I17		
3204-3 J4	F218 I15		
3204-4 J4	F219 I15		
3210 C16	F220 I15		
3211 D8	F221 I15		
3212 D2	F222 I15		
3213 C15	F223 I15		
3215 D2	F224 I15		
3216 C15	F225 J15		
3217 C16	F226 J15		
3219 E1	F227 J15		
3220 E2	F228 J15		
3221 E1	F229 J15		
3222 E2	F230 J15		
3223 E16	F231 C5		
3224 E16	F232 E4		
3225 E16	I210 B5		
3226 E16	I211 A16		
3227 E16	I213 A13		
3228 G2	I214 C5		
3229 G2	I215 C16		
3230 G2	I216 B15		
3231 G2	I217 D8		
3232 G3	I218 E8		
3233 E16	I220 C15		
3235 E16	I224 C15		
3238 E16	I225 C16		
3239 K4	I230 E4		
3240 K3	I231 E4		

3139 123 6261.1

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SSB: PNX2015: Audio Processor

B04C AUDIO PROCESSOR

B04C

7410 L78L08ACU

7411 MSP4450P-VK-E8 000

Φ MULTISTANDARD SOUND PROCESSOR

Item	iTV	EU- with Side AV	AP/CH/LT with Side AV	Description
4403	☐	☑	☑	RST SM 0603 JUMP. 0R05 COL
4406	☐	☑	☑	RST SM 0603 JUMP. 0R05 COL
4407	☑	☑	☐	RST SM 0603 JUMP. 0R05 COL
4408	☑	☑	☐	RST SM 0603 JUMP. 0R05 COL
4411	☑	☑	☐	RST SM 0603 JUMP. 0R05 COL

3139 123 6261.1

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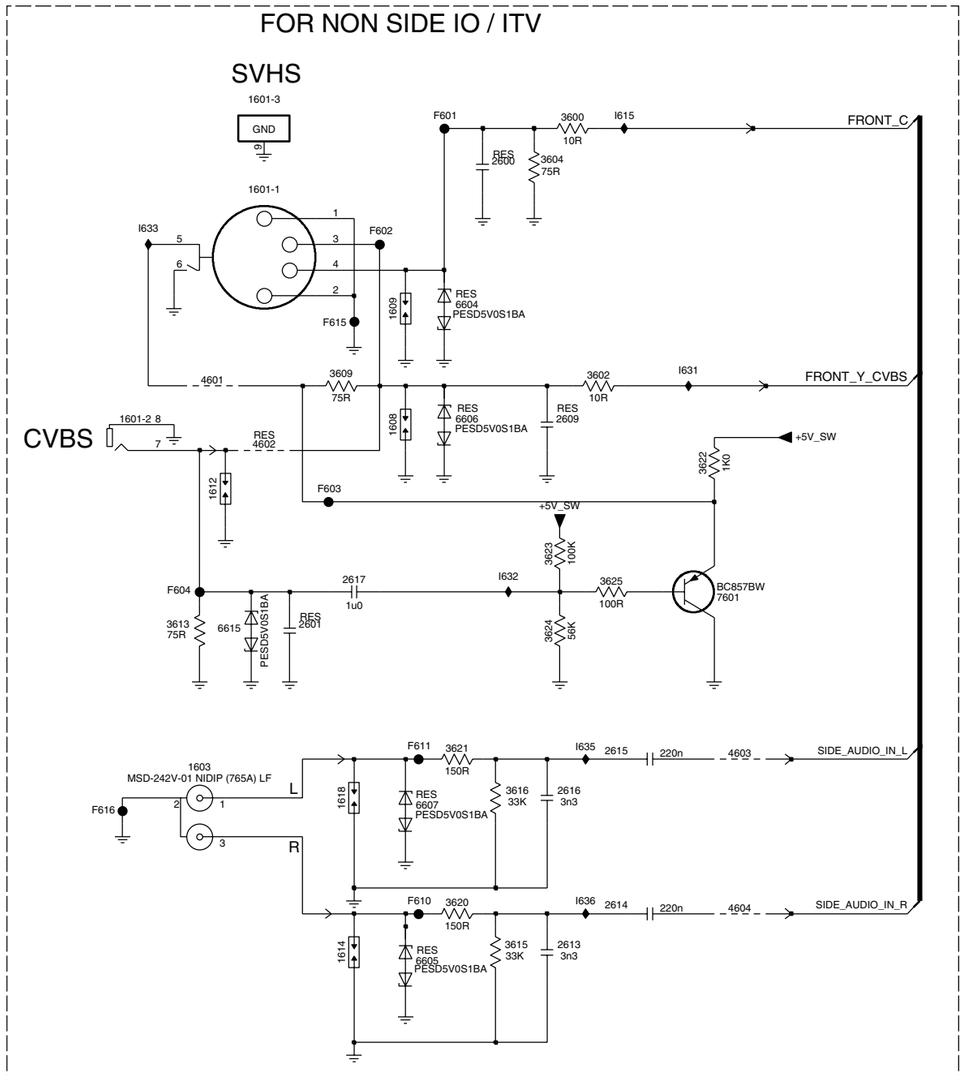
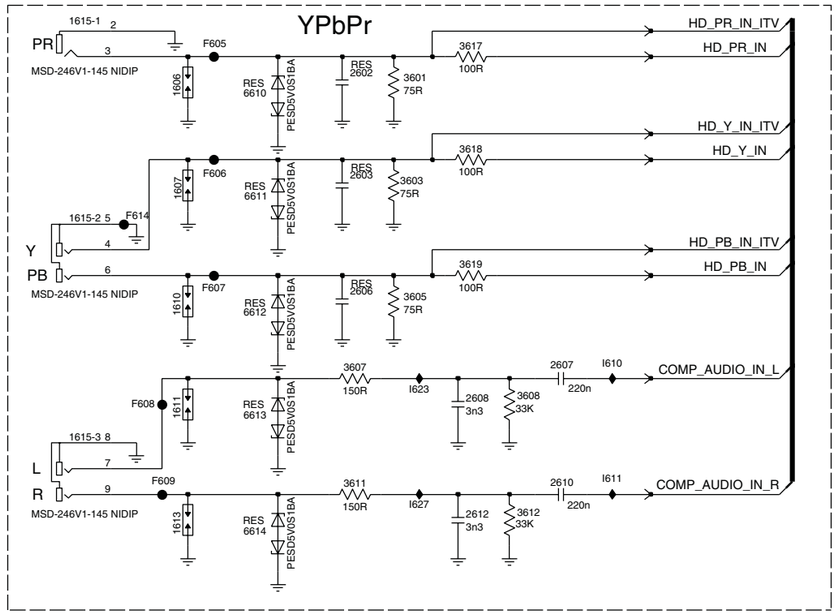
1411 B3 I421 D4
2408 A4 I422 D4
2409 A4 I423 E4
2410 A4 I424 E4
2411 A2 I425 F4
2412 A4 I426 A3
2413 A6 I427 C4
2414 B2 I428 C4
2415 B3 I429 C2
2416 B3 I430 C2
2417 B7 I431 D4
2418 B7 I432 D2
2419 C3
2420 C6
2421 C7
2422 C7
2423 C6
2424 D7
2425 D7
2426 D7
2427 D7
2428 D6
2429 D7
2430 D7
2431 D7
2432 D2
2433 D3
2434 E3
2435 E3
2436 E3
2437 F4
2438 F4
2439 A3
2440 A3
2441 A4
2442 A4
2443 A6
2444 A6
2445 E3
2446 C3
2447 C3
3402 A1
3410 C3
3411 C3
3416 E2
3417 D8
3418 D8
3419 D8
3420 D8
4401 A2
4402 A2
4403 E3
4406 F3
4407 C3
4408 C3
4409 D3
4410 D3
4411 D3
4412 D3
5401 A1
5402 B1
5403 E2
7410 A4
7411 B4
F401 A4
F402 A4
F403 A5
I412 C3
I413 C3
I414 C6
I415 C6
I416 D6
I417 D6
I418 D6
I419 D6
I420 D3

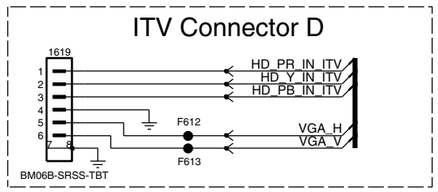
SSB: YPBPR & Rear IO

B06A YPBPR & REAR IO

B06A







3139 123 6261.1

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240107

1601-1 B2
1601-2 D1
1601-3 B2
1603 E2
1606 B7
1607 C7
1608 D3
1609 C3
1610 C7
1611 D7
1612 D2
1613 D7
1614 F2
1615-1 B7
1615-2 C7
1615-3 D7
1618 F2
1619 E7
2600 B3
2601 E2
2602 B8
2603 B8
2606 C8
2607 C9
2608 D9
2609 D4
2610 D9
2612 D9
2613 F4
2614 F4
2615 E4
2616 F4
2617 D2
3600 B4
3601 B8
3602 C4
3603 B8
3604 B4
3605 C8
3607 D8
3608 D9
3609 C2
3611 D8
3612 D9
3613 E1
3615 F3
3616 F3
3617 B9
3618 B9
3619 C9
3620 F3
3621 E3
3622 D4
3623 D4
3624 E4
3625 D4
4601 C2
4602 D2
4603 E5
4604 F5
6604 C3
6605 G3
6606 D3
6607 F3
6610 B8
6611 C8
6612 C8
6613 D8
6614 D8
6615 E2
7601 D4
F601 B3
F602 C3
F603 D2
F604 D1
F605 B7
F606 B7
F607 C7
F608 D7
F609 D7
F610 F3
F611 E3
F612 F7
F613 F7
F614 C7
F615 C2
F616 F1
I610 C10
I611 D10
I615 B4
I623 D9
I627 D9
I631 C4
I632 D3
I633 B1
I635 E4
I636 F4

SSB: I/O Scart 1 & 2

B06B IO - SCART 1 & 2

B06B

Item	non-iTV	iTV Analog	iTV-Digital	Description
1504	✓	✓		SOC EURO V 21P F BK R-GRND B
1506	✓	✓		SOC EURO V 21P F BK R-GRND B
1525		✓	✓	CON V 5P M 1.00 SM SR R
1526		✓	✓	CON V 8P M 1.00 SM SR R
3516	✓			RST SM 0603 100R PM5 COL
		✓	✓	RST SM 0603 680R PM5 COL
3523	✓			RST SM 0603 100R PM5 COL
		✓	✓	RST SM 0603 680R PM5 COL
3528	✓			RST SM 0603 100R PM5 COL
		✓	✓	RST SM 0603 680R PM5 COL

ITV-Connector B

1526: 1 SC1_B_IN, 2 SC1_G_IN, 3 SC1_R_IN, 4 SC1_FBL_IN, 5 SC1_AUDIO_OUT_L, 6 SC1_AUDIO_OUT_R, 7 8 9 10

ITV-Connector C

1525: 1 SC2_AUDIO_IN_R, 2 SC2_AUDIO_IN_L, 3 4 SC2_Y_CVBS_IN_ITV, 5 SC2_C_IN_ITV, 6 7

SCART 1

1504: Audio-R_out 1 F511, Audio-R_in 2 F513, Audio-L_out 3 F515, 4 F517, 5, Audio-L_in 6 F519, RGB-B_in 7 F520, Function_Sw 8 F521, 9, 10 1509, RGB-G_in 11 F522, 12 1512, 13, 14, RGB-R_in 15 F531, RGB-BL_in 16 F524, 17 F525, 18, Terr_CVBS_out 19 F526, Video_in 20 F528, 21 — PPTV/55

SC1_AUDIO_MUTE_R
SC1_AUDIO_OUT_R
SC1_AUDIO_OUT_L
SC1_AUDIO_MUTE_L
SC1_AUDIO_IN_R
SC1_AUDIO_IN_L
SC1_B_IN
SC1_STATUS
SC1_G_IN
SC1_R_IN
SC1_FBL_IN
SC1_CVBS_IN

SCART 2

1506: Audio-R_out 1 F510, Audio-R_in 2 F512, Audio-L_out 3 F514, 4 F516, 5, Audio-L_in 6 F518, 7, Function_Sw 8 F532, 9, 10 1510, 11, 12 1513, 13, 14, RGB-R_out/YC-C_in 15 F523, 16, 17, 18, CVBS_out 19 F527, Video/YC-Y_in 20 F529, 21 — PPTV/55

SC2_AUDIO_MUTE_R
SC2_AUDIO_OUT_R
SC2_AUDIO_OUT_L
SC2_AUDIO_MUTE_L
SC2_AUDIO_IN_R
SC2_AUDIO_IN_L
SC2_STATUS
SC2_C_IN_ITV
SC2_C_IN
SC2_CVBS_MON_OUT
SC2_CVBS_MON_OUT_ITV
SC2_Y_CVBS_IN_ITV
SC2_Y_CVBS_IN
SC1_RF_OUT_CVBS
SC1_CVBS_RF_OUT

+5V_SW, 5V2, 3V7, 3V

7500 BC847B, 7502 BC857BW, 7503 BC847B, 7504 BC857BW

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1500 C9	6522 C10	3503 F4	3538 G11
1501 C9	6523 C10	3506 D10	3540 I12
1502 C3	6524 E10	3507 C4	3545 H4
1503 D9	6525 G9	3508 D11	3546 H4
1504 C2	7500 G10	3510 C4	3550 E10
1505 C3	7502 G11	3511 D4	3551 E10
1506 D8	7503 I11	3512 D10	3552 F11
1507 D3	7504 I11	3513 E11	3553 F11
1508 E9	F510 D9	3514 D4	3554 I12
1509 D2	F511 C2	3515 D4	3555 H12
1510 E9	F512 D9	3516 E4	4502 G11
1511 D3	F513 C2	3517 E4	4504 I12
1512 E2	F514 D9	3518 E3	6501 D10
1513 E9	F515 C2	3519 G10	6504 D3
1514 E9	F516 D9	3520 E4	6505 E10
1515 F9	F517 C2	3521 G12	6507 D3
1516 E3	F518 D9	3522 G10	6509 F10
1517 E3	F519 D2	3523 F4	6510 H9
1518 G9	F520 D2	3524 I11	6511 H3
1519 F3	F521 D2	3525 G10	6512 G5
1520 G3	F522 D2	3526 F4	6513 G5
1521 H9	F523 F9	3528 F4	6514 E3
1522 G3	F524 E2	3529 H10	6515 F3
1523 H3	F525 E2	3530 G4	6516 G3
1524 H3	F526 F2	3531 H10	6517 H3
1525 A2	F527 F9	3532 G4	6518 C3
1526 A1	F528 F2	3533 G4	6519 C3
2502 C10	F529 F9	3535 H3	6520 E3
2506 C10	F530 H5	3536 H4	6521 G3
2508 B4	F531 E2	3537 I12	
2509 D12	F532 E9		
2512 D10	F534 B4		
2514 C4	F535 C4		
2515 C5	F536 C4		
2517 D4	F537 D4		
2518 D12	F538 E5		
2520 E10	F539 E4		
2521 D5	F540 F4		
2523 D4	F541 F5		
2524 F10	F542 G4		
2525 G10	F543 D11		
2526 G10	F544 D11		
2527 F4	I510 B11		
2528 E4	I512 C11		
2529 F4	I517 D12		
2530 H10	I520 D12		
2531 G4	I528 G12		
2533 I11	I530 G10		
2534 I10	I533 H12		
2535 H3	I540 C5		
2536 G10	I541 D5		
2538 H3	I543 G10		
3500 B10	I544 G12		
3502 C10	I545 E11		
3503 B4	I548 I11		
3506 D10	I549 I11		
3507 C4	I550 G4		
3508 D11	I551 G10		
3510 C4	I552 G11		
3511 D4	I553 I11		
3512 D10	I554 I12		
3513 E11	I556 H12		
3514 D4	I557 F12		
3515 D4			
3516 E4			
3517 E4			
3518 E3			
3519 G10			
3520 E4			
3521 G12			
3522 G10			
3523 F4			
3524 I11			
3525 G10			
3526 F4			
3528 F4			
3529 H10			
3530 G4			
3531 H10			
3532 G4			
3533 G4			
3535 H3			
3536 H4			
3537 I12			

SSB: HDMI

B06C HDMI

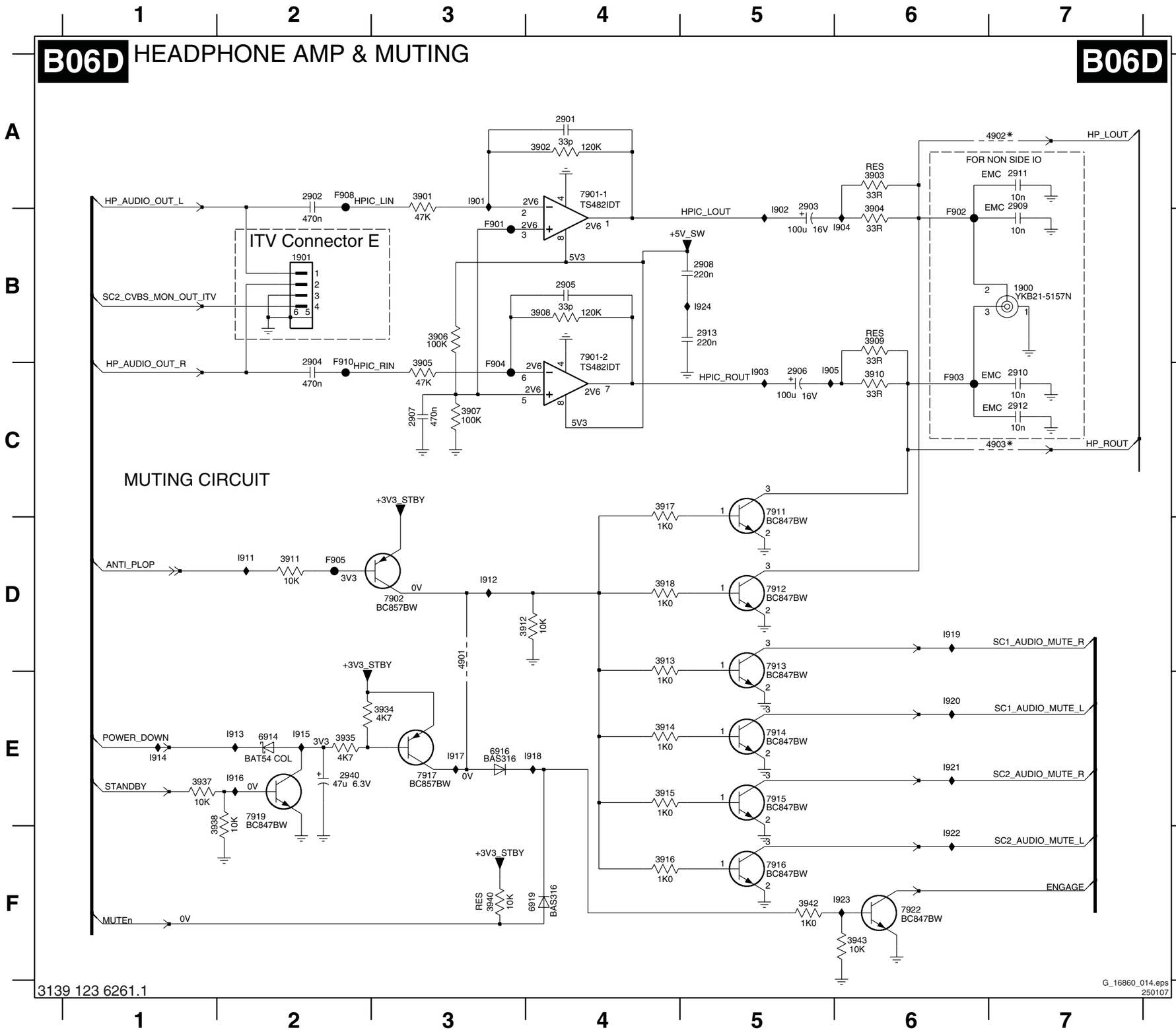
B06C

HDMI CONNECTOR-1
HDMI CONNECTOR-2
DC1R019JBAR190
BC847BW
BSN20
M24C02-WMN6 EEPROM (256x8)
BAT54 COL
AUDIO DAC
UDA1334ATS
SII9025CTU
MAIN
POWER
RES
HDMI_Cb(0:7)
HDMI_Y(0:7)
HDMI_Cr(0:7)
HDMI_DE
HDMI_H
HDMI_V
HDMI_VCLK
HDMI_I2S_SCK
HDMI_I2S_WS
HDMI_I2S_SD
HDMI_AUDIO_IN_R
HDMI_AUDIO_IN_L
DOC_SCLA
DOC_SDAA
DOC_SCLB
DOC_SDAB
HDMI_HOTPLUG_RESET
DDC_RESET
+5VHDMI_A
+5VHDMI_B
HDMI_INT
RST
IIC_SCL
IIC_SDA

3139 123 6261.1

1810 A1	3881 F2	2801 G3	3884 I6
1811 D1	3882 F2	2802 H3	3885 I7
1823 H8	3883 F3	2803 C7	3886 I7
2801 G3	3884 I6	2804 A7	3896 G5
2802 H3	3885 I7	2805 G3	3897 G5
2803 C7	3886 I7	2806 H3	4802 H6
2804 A7	3896 G5	2807 H2	4803 H6
2805 G3	3897 G5	2808 H2	4804 A6
2806 H3	4802 H6	2809 H8	4805 C6
2807 H2	4803 H6	2810 H6	5810 A11
2808 H2	4804 A6	2811 H2	5811 A11
2809 H8	4805 C6	2812 I2	5812 A11
2810 H6	5810 A11	2813 H8	5813 A12
2811 H2	5811 A11	2814 I2	5814 A12
2812 I2	5812 A11	2815 I2	5815 A13
2813 H8	5813 A12	2816 B11	5816 A13
2814 I2	5814 A12	2817 B11	5817 A10
2815 I2	5815 A13	2818 C11	5818 A13
2816 B11	5816 A13	2819 B11	6801 C5
2817 B11	5817 A10	2828 H8	6802 C5
2818 C11	5818 A13	2829 B10	6830 A5
2819 B11	6801 C5	2830 B10	6831 A5
2828 H8	6802 C5	2833 B11	7810 I3
2829 B10	6830 A5	2835 B12	7811 C5
2830 B10	6831 A5	2836 B12	7812 D7
2833 B11	7810 I3	2838 B12	7813 E7
2835 B12	7811 C5	2839 B12	7814 C2
2836 B12	7812 D7	2840 B12	7816 C3
2838 B12	7813 E7	2843 B13	7817-1 E9
2839 B12	7814 C2	2844 B13	7817-2 D10
2840 B12	7816 C3	2845 B13	7817-3 C9
2843 B13	7817-1 E9	2847 C10	7824 H5
2844 B13	7817-2 D10	2848 C10	7825 H7
2845 B13	7817-3 C9	2849 C11	7850 A5
2847 C10	7824 H5	2850 C11	7851 B7
2848 C10	7825 H7	2851 C11	7852 B7
2849 C11	7850 A5	2852 C11	7860 F2
2850 C11	7851 B7	2853 C12	7861 F3
2851 C11	7852 B7	2854 C12	F801 G3
2852 C11	7860 F2	2855 C12	F802 H4
2853 C12	7861 F3	2856 C12	F805 I12
2854 C12	F801 G3	2857 C12	F806 I12
2855 C12	F802 H4	2858 C13	F832 A1
2856 C12	F805 I12	2859 C13	F840 B1
2857 C12	F806 I12	2860 C13	F841 B1
2858 C13	F832 A1	2861 C13	F842 B1
2859 C13	F840 B1	2865 C10	F843 B1
2860 C13	F841 B1	2866 C10	F850 H6
2861 C13	F842 B1	2867 C11	F851 H7
2865 C10	F843 B1	2868 C11	F861 D1
2866 C10	F850 H6	2869 C11	F869 E1
2867 C11	F851 H7	2870 C12	F870 E1
2868 C11	F861 D1	2871 C12	F871 E1
2869 C11	F869 E1	2872 C12	F872 E1
2870 C12	F870 E1	2873 C12	F873 C6
2871 C12	F871 E1	2874 C12	F874 A6
2872 C12	F872 E1	2875 C13	F875 D13
2873 C12	F873 C6	2876 C13	F876 F6
2874 C12	F874 A6	3801 C6	F877 G6
2875 C13	F875 D13	3802 C7	I801 H2
2876 C13	F876 F6	3803 G3	I802 H2
3801 C6	F877 G6	3804 G3	I803 H3
3802 C7	I801 H2	3805 I2	I804 I2
3803 G3	I802 H2	3806 I2	I805 I2
3804 G3	I803 H3	3807-1 I5	I806 I2
3805 I2	I804 I2	3807-2 I5	I813 I12
3806 I2	I805 I2	3807-3 I5	I814 I12
3807-1 I5	I806 I2	3807-4 I5	I820 D7
3807-2 I5	I813 I12	3809 H5	I821 E7
3807-3 I5	I814 I12	3810 C6	I822 B7
3807-4 I5	I820 D7	3811 H8	I823 C7
3809 H5	I821 E7	3815 H8	I828 I6
3810 C6	I822 B7	3819 I8	I831 C2
3811 H8	I823 C7	3828 D7	I833 C2
3815 H8	I828 I6	3830 A6	I840 C3
3819 I8	I831 C2	3831 A6	I841 C3
3828 D7	I833 C2	3832 A7	I842 F3
3830 A6	I840 C3	3833 B7	I843 F3
3831 A6	I841 C3	3834 B7	I844 G6
3832 A7	I842 F3	3835 E11	I845 G6
3833 B7	I843 F3	3846 E7	I846 H8
3834 B7	I844 G6	3850 H7	I847 H9
3835 E11	I845 G6	3851-1 E11	I848 I8
3846 E7	I846 H8	3851-2 E11	I850 A10
3850 H7	I847 H9	3851-3 E11	I851 A11
3851-1 E11	I848 I8	3851-4 F11	I852 A11
3851-2 E11	I850 A10	3852-1 F11	I853 A12
3851-3 E11	I851 A11	3852-2 F11	I854 A12
3851-4 F11	I852 A11	3852-3 F11	I855 A13
3852-1 F11	I853 A12	3852-4 F11	I856 A13
3852-2 F11	I854 A12	3853-1 F11	I857 A13
3852-3 F11	I855 A13	3853-2 F11	I858 A11
3852-4 F11	I856 A13	3853-3 G11	I861 F2
3853-1 F11	I857 A13	3853-4 G11	I862 H9
3853-2 F11	I858 A11	3854-1 G11	I863 H3
3853-3 G11	I861 F2	3854-2 G11	I864 I7
3853-4 G11	I862 H9	3854-3 G11	I865 I7
3854-1 G11	I863 H3	3854-4 G11	I866 I7
3854-2 G11	I864 I7	3855-1 H11	
3854-3 G11	I865 I7	3855-2 H11	
3854-4 G11	I866 I7	3855-3 H11	
3855-1 H11		3855-4 H11	
3855-2 H11		3856-1 H11	
3855-3 H11		3856-2 H11	
3855-4 H11		3856-3 H11	
3856-1 H11		3856-4 I11	
3856-2 H11		3857 I11	
3856-3 H11		3858 I11	
3856-4 I11		3859 I11	
3857 I11		3860 I11	
3858 I11		3862 B2	
3859 I11		3863 C2	
3860 I11		3864 C2	
3862 B2		3877 C3	
3863 C2		3880 E2	
3864 C2			
3877 C3			
3880 E2			

SSB: Headphone Amp & Muting



1900 B7 I915 E2
1901 B2 I916 E2
2901 A4 I917 E3
2902 A2 I918 E4
2903 B5 I919 D6
2904 C2 I920 E6
2905 B4 I921 E6
2906 C5 I922 F6
2907 C3 I923 F6
2908 B5 I924 B5
2909 A7
2910 C7
2911 A7
2912 C7
2913 B5
2940 E2
3901 A3
3902 A4
3903 A6
3904 B6
3905 C3
3906 B3
3907 C3
3908 B4
3909 B6
3910 C6
3911 D2
3912 D4
3913 D4
3914 E4
3915 E4
3916 F4
3917 C4
3918 D4
3934 E3
3935 E2
3937 E1
3938 E2
3940 F3
3942 F5
3943 F6
4901 D3
4902 A7
4903 C7
6914 E2
6916 E3
6919 F4
7901-1 A4
7901-2 B4
7902 D3
7911 C5
7912 D5
7913 D5
7914 E5
7915 E5
7916 F5
7917 E3
7919 E2
7922 F6
F901 B3
F902 B6
F903 C6
F904 C3
F905 D2
F908 A2
F910 B2
I901 A3
I902 B5
I903 C5
I904 B6
I905 C5
I911 D2
I912 D3
I913 E2
I914 E1

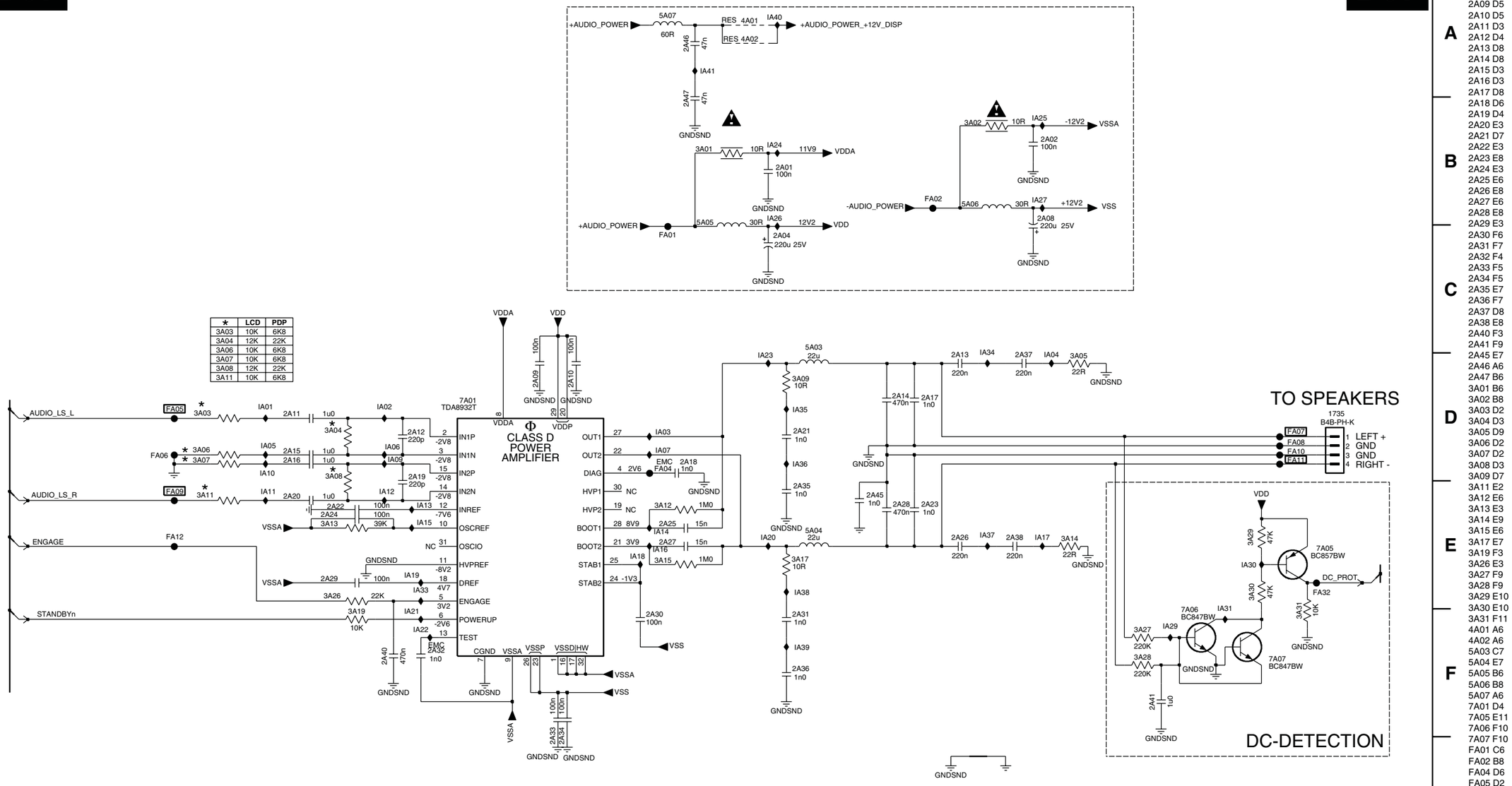
Item	EU iTV	non-iTV	US iTV	Description
1901	✓	–	✓	CON V 4P M 1.00 SM SR R
2901	✓	✓	–	CER1 0603 NP0 50V 33P COL
2902	✓	✓	–	CER2 0603 Y5V 10V 470N COL
2903	✓	✓	–	ELCAP SM 16V 100U PM20 COL R
2904	✓	✓	–	CER2 0603 Y5V 10V 470N COL
2905	✓	✓	–	CER1 0603 NP0 50V 33P COL
2906	✓	✓	–	ELCAP SM 16V 100U PM20 COL R
2907	✓	✓	–	CER2 0603 Y5V 10V 470N COL
2909	✓	–	–	CER2 0603 X7R 50V 10N COL
2910	✓	–	–	CER2 0603 X7R 50V 10N COL
2911	✓	–	–	CER2 0603 X7R 50V 10N COL
2912	✓	–	–	CER2 0603 X7R 50V 10N COL
3901	✓	✓	–	RST SM 0603 47K PM5 COL
3902	✓	✓	–	RST SM 0603 RC21 120K PM5 R
3904	✓	✓	–	RST SM 0603 33R PM5 COL
3905	✓	✓	–	RST SM 0603 47K PM5 COL
3906	✓	✓	–	RST SM 0603 100K PM5 COL
3907	✓	✓	–	RST SM 0603 100K PM5 COL
3908	✓	✓	–	RST SM 0603 RC21 120K PM5 R
3910	✓	✓	–	RST SM 0603 33R PM5 COL
3917	✓	✓	–	RST SM 0603 1K PM5 COL
3918	✓	✓	–	RST SM 0603 1K PM5 COL
4902	–	✓	–	RST SM 0603 JUMP. 0R05 COL
4903	–	✓	–	RST SM 0603 JUMP. 0R05 COL
7901	✓	✓	–	IC SM TS482ID (ST00) R
7911	✓	✓	–	TRA SIG SM BC847BW (COL) R
7912	✓	✓	–	TRA SIG SM BC847BW (COL) R

SSB: Audio

B07 AUDIO

B07

*	LCD	PDP
3A03	10K	6K8
3A04	12K	22K
3A06	10K	6K8
3A07	10K	6K8
3A08	12K	22K
3A11	10K	6K8



1735 D11	IA02 D3
2A01 B7	IA03 D6
2A02 B9	IA04 D9
2A04 C7	IA05 D3
2A08 B9	IA06 D4
2A09 D5	IA07 D6
2A10 D5	IA09 D4
2A11 D3	IA10 D3
2A12 D4	IA11 E3
2A13 D8	IA12 E3
2A14 D8	IA13 E4
2A15 D3	IA14 E6
2A16 D3	IA15 E4
2A17 D8	IA16 E6
2A18 D6	IA17 E9
2A19 D4	IA18 E5
2A20 E3	IA19 E4
2A21 D7	IA20 E6
2A22 E3	IA21 F4
2A23 E8	IA22 F4
2A24 E3	IA23 D6
2A25 E6	IA24 B7
2A26 E8	IA25 B9
2A27 E6	IA26 B7
2A28 E8	IA27 B9
2A29 E3	IA29 F10
2A30 F6	IA30 E10
2A31 F7	IA31 E10
2A32 F4	IA33 E4
2A33 F5	IA34 C8
2A34 F5	IA35 D7
2A35 E7	IA36 D7
2A36 F7	IA37 E8
2A37 D8	IA38 E7
2A38 E8	IA39 F7
2A40 F3	IA40 A7
2A41 F9	IA41 A6
2A45 E7	
2A46 A6	
2A47 B6	
3A01 B6	
3A02 B8	
3A03 D2	
3A04 D3	
3A05 D9	
3A06 D2	
3A07 D2	
3A08 D3	
3A09 D7	
3A11 E2	
3A12 E6	
3A13 E3	
3A14 E9	
3A15 E6	
3A17 E7	
3A19 F3	
3A26 E3	
3A27 F9	
3A28 F9	
3A29 E10	
3A30 E10	
3A31 F11	
4A01 A6	
4A02 A6	
5A03 C7	
5A04 E7	
5A05 B6	
5A06 B8	
5A07 A6	
7A01 D4	
7A05 E11	
7A06 F10	
7A07 F10	
FA01 C6	
FA02 B8	
FA04 D6	
FA05 D2	
FA06 D2	
FA07 D11	
FA08 D11	
FA09 E2	
FA10 D11	
FA11 D11	
FA12 E2	
FA32 E11	
IA01 D3	

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SSB: SRP List

1.1. Introduction

SRP (Service Reference Protocol) is a software tool that creates a list with all references to signal lines. The list contains references to the signals within all schematics of a PWB. It replaces the text references currently printed next to the signal names in the schematics. These printed references are created manually and are therefore not guaranteed to be 100% correct. In addition, in the current crowded schematics there is often none or very little place for these references.
Some of the PWB schematics will use SRP while others will still use the manual references. Either there will be an SRP reference list for a schematic, or there will be printed references in the schematic.

1.2. Non-SRP Schematics

There are several different signals available in a schematic:

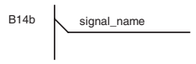
1.2.1. Power Supply Lines

All power supply lines are available in the supply line overview (see chapter 6). In the schematics (see chapter 7) is not indicated where supplies are coming from or going to.
It is however indicated if a supply is incoming (created elsewhere), or outgoing (created or adapted in the current schematic).

Outgoing Incoming

1.2.2. Normal Signals

For normal signals, a schematic reference (e.g. B14b) is placed next to the signals.



1.2.3. Grounds

For normal and special grounds (e.g. GNDHOT or GND3V3 etc.), nothing is indicated.

1.3. SRP Schematics

SRP is a tool, which automatically creates a list with signal references, indicating on which schematic the signals are used.
A reference is created for all signals indicated with an SRP symbol, these symbols are:

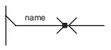
Power supply line.

Stand alone signal or switching line (used as less as possible).

Signal line into a wire tree.

Switching line into a wire tree.

Bi-directional line (e.g. SDA) into a wire tree.



Signal line into a wire tree, its direction depends on the circuit (e.g. ingoing for PDP, outgoing for LCD sets).

Remarks:

- When there is a black dot on the "signal direction arrow" it is an SRP symbol, so there will be a reference to the signal name in the SRP list.
- All references to normal grounds (Ground symbols without additional text) are not listed in the reference list, this to keep it concise.
- Signals that are not used in multiple schematics, but only once or several times in the same schematic, are included in the SRP reference list, but only with one reference.

Additional Tip:

When using the PDF service manual file, you can very easily search for signal names and follow the signal over all the schematics. In Adobe PDF reader:

- Select the signal name you want to search for, with the "Select text" tool.
- Copy and paste the signal name in the "Search PDF" tool.
- Search for all occurrences of the signal name.
- Now you can quickly jump between the different occurrences and follow the signal over all schematics. It is advised to "zoom in" to e.g. 150% to see clearly, which text is selected. Then you can zoom out, to get an overview of the complete schematic.

PS. It is recommended to use at least Adobe PDF (reader) version 6.x, due to better search possibilities in this version.

Netname	Schematic
+12V_DISP	B02 (1x)
+12V_DISP	B04A (1x)
+12V_DISP	B04B (1x)
+1V2_MOJO	B02 (1x)
+1V2_MOJO	B03D (2x)
+1V8S_SW	B02 (1x)
+1V8S_SW	B03B (2x)
+1V8S_SW	B03F (1x)
+1V8S_SW	B04B (3x)
+1V8S_SW	B06C (3x)
+3V3	B03B (3x)
+3V3	B03C (3x)
+3V3	B03D (8x)
+3V3	B03E (2x)
+3V3	B03F (1x)
+3V3_BUF	B03C (4x)
+3V3_CORE	B03C (2x)
+3V3_MOJO	B02 (1x)
+3V3_MOJO	B03F (2x)
+3V3_NOR48	B03E (4x)
+3V3_STBY	B02 (1x)
+3V3_STBY	B04A (30x)
+3V3_STBY	B06D (3x)
+3V3_STV	B03C (10x)
+3V3_SW	B02 (1x)
+3V3_SW	B04A (8x)
+3V3_SW	B04B (13x)
+3V3_SW	B06C (19x)
+3V3_VDDP	B03D (3x)
+3V3clean	B03D (1x)
+3V3clean	B03F (1x)
+3V3FE	B03B (5x)
+5V_AUD	B04C (3x)
+5V_D	B04C (2x)
+5V_IF	B03A (4x)
+5V_STANDBY	B02 (4x)
+5V_STANDBY	B04A (4x)
+5V_STANDBY	B04B (2x)
+5V_SW	B02 (6x)
+5V_SW	B03A (4x)
+5V_SW	B03B (9x)
+5V_SW	B03C (2x)
+5V_SW	B03E (3x)
+5V_SW	B04A (1x)
+5V_SW	B04B (2x)
+5V_SW	B04C (2x)
+5V_SW	B06A (2x)
+5V_SW	B06B (2x)
+5V_SW	B06D (1x)
+5VHDMI_A	B06C (3x)
+5VHDMI_B	B06C (3x)
+5VS	B03A (3x)
+8V	B04C (2x)
+AUDIO_POWER	B02 (1x)
+AUDIO_POWER	B04C (1x)
+AUDIO_POWER	B06A (1x)
+AUDIO_POWER	B07 (1x)
+IO_POWER	B06A (10x)
+IO_POWER	B06B (7x)
+VTUN	B02 (1x)
+VTUN	B03A (1x)
+VTUN	B04A (1x)
10046_TDO	B03B (1x)
10046_TDO	B03D (1x)
4MHZ_CLK	B03A (1x)
4MHZ_CLK	B03B (1x)
4MHz_MOJO	B03B (1x)
4MHz_MOJO	B03D (1x)
A(0)	B04A (1x)
A(0)	B04B (1x)
A(0:7)	B04A (1x)
A(0:7)	B04B (1x)
A(1)	B04A (2x)
A(1)	B04B (1x)
A(1:7)	B04A (1x)
A(10)	B04A (2x)
A(11)	B04A (2x)
A(12)	B04A (2x)
A(13)	B04A (2x)
A(14)	B04A (2x)
A(15)	B04A (2x)
A(16)	B04A (2x)
A(17)	B04A (2x)
A(18)	B04A (2x)
A(19)	B04A (2x)
A(2)	B04A (2x)
A(2)	B04B (1x)
A(3)	B04A (2x)
A(3)	B04B (1x)
A(4)	B04A (2x)
A(4)	B04B (1x)
A(5)	B04A (2x)
A(5)	B04B (1x)
A(6)	B04A (2x)
A(6)	B04B (1x)
A(7)	B04A (2x)
A(7)	B04B (1x)
A(8)	B04A (2x)
A(8:19)	B04A (2x)
A(9)	B04A (2x)
A_MICLK	B03C (1x)
A_MISTRT	B03C (1x)
A_MIVAL	B03C (1x)
A_MOCLK	B03C (1x)
A_MOSTRT	B03C (1x)
A_MOVAL	B03C (1x)
AD(0)	B04A (2x)
AD(0)	B04B (1x)
AD(0:7)	B04A (2x)
AD(0:7)	B04B (1x)
AD(1)	B04A (2x)
AD(1)	B04B (1x)
AD(2)	B04A (2x)
AD(2)	B04B (1x)
AD(3)	B04A (2x)
AD(3)	B04B (1x)
AD(4)	B04A (2x)
AD(4)	B04B (1x)
AD(5)	B04A (2x)
AD(5)	B04B (1x)
AD(6)	B04A (2x)
AD(6)	B04B (1x)
AD(7)	B04A (2x)
AD(7)	B04B (1x)
ALE_EMU	B04A (1x)
ALE_EMU	B04B (1x)
ANTI_PLOP	B04A (1x)
ANTI_PLOP	B06D (1x)
AUDIO_LS_L	B04C (1x)
AUDIO_LS_L	B07 (1x)
AUDIO_LS_R	B04C (1x)
AUDIO_LS_R	B07 (1x)
-AUDIO_POWER	B02 (1x)
-AUDIO_POWER	B07 (1x)
BACKLIGHT_BOOST	B02 (1x)
BACKLIGHT_BOOST	B04A (1x)
BL_ADJUST	B02 (1x)
BL_ADJUST	B04A (1x)
BL_ADJUST	B04B (1x)
BL_ON_OFF	B02 (1x)
BL_ON_OFF	B04A (1x)
BOLT_ON_SCL	B04A (2x)
BOLT_ON_SDA	B04A (2x)
CE	B04A (1x)
COMP_AUDIO_IN_L	B04C (1x)
COMP_AUDIO_IN_L	B06A (1x)
COMP_AUDIO_IN_R	B04C (1x)
COMP_AUDIO_IN_R	B06A (1x)
CPU_RST	B04A (1x)
CS	B04A (1x)
CS	B04B (1x)
CTRL_DISP1	B04B (2x)
CTRL_DISP1_up	B04A (1x)
CTRL_DISP1_up	B04B (1x)
CTRL_DISP2	B04B (2x)
CTRL_DISP3	B04B (2x)
CTRL_DISP4	B04B (2x)
CTRL_DISP4_up	B04A (1x)
CTRL_DISP4_up	B04B (1x)
CVBS_RF	B03A (1x)
CVBS_RF	B04B (1x)
CX_AVDD_ADC1	B04B (2x)
CX_AVDD_ADC2	B04B (2x)
CX_AVDD_ADC3	B04B (2x)
CX_AVDD_ADC4	B04B (2x)
CX_AVDD3_ADC1	B04B (2x)
CX_AVDD3_ADC2	B04B (2x)
CX_AVDD3_BG_ASS	B04B (2x)
CX_AVDD3_OUTBUF	B04B (2x)
CX_PAVDD	B04B (2x)
CX_PAVDD1	B04B (2x)
CX_PAVDD2	B04B (2x)
CX_PDVDD	B04B (2x)
DC_PROT	B04A (1x)
DC_PROT	B07 (1x)
DDC_RESET	B04A (1x)
DDC_RESET	B06C (2x)
DVB_SW	B03A (1x)
DVB_SW	B04A (1x)
E_PAGE	B04A (1x)
ENGAGE	B06D (1x)
ENGAGE	B07 (1x)
FE_LOCK	B03B (1x)
FE_LOCK	B03D (1x)
FRONT_C_IN	B04B (1x)
FRONT_C_IN	B06A (1x)
FRONT_Y_CVBS_IN	B04B (1x)
FRONT_Y_CVBS_IN	B06A (1x)
GNDDC	B02 (1x)
GNDSND	B02 (3x)
GNDSND	B07 (21x)
GNDTUN	B02 (1x)
HD_PB_IN	B04B (1x)
HD_PB_IN	B06A (2x)
HD_PR_IN	B04B (1x)
HD_PR_IN	B06A (2x)
HD_Y_IN	B04B (1x)
HD_Y_IN	B06A (2x)
HDMI_AUDIO_IN_L	B04C (1x)
HDMI_AUDIO_IN_L	B06C (1x)
HDMI_AUDIO_IN_R	B04C (1x)
HDMI_AUDIO_IN_R	B06C (1x)
HDMI_Cb(0)	B04B (1x)
HDMI_Cb(0)	B06C (1x)
HDMI_Cb(0:7)	B04B (1x)
HDMI_Cb(0:7)	B06C (1x)
HDMI_Cb(1)	B04B (1x)
HDMI_Cb(1)	B06C (1x)
HDMI_Cb(2)	B04B (1x)
HDMI_Cb(2)	B06C (1x)
HDMI_Cb(3)	B04B (1x)
HDMI_Cb(3)	B06C (1x)
HDMI_Cb(4)	B04B (1x)
HDMI_Cb(4)	B06C (1x)
HDMI_Cb(5)	B04B (1x)
HDMI_Cb(5)	B06C (1x)
HDMI_Cb(6)	B04B (1x)
HDMI_Cb(6)	B06C (1x)
HDMI_Cb(7)	B04B (1x)
HDMI_Cb(7)	B06C (1x)
HDMI_Cr(0)	B04B (1x)
HDMI_Cr(0)	B06C (1x)
HDMI_Cr(0:7)	B04B (1x)
HDMI_Cr(0:7)	B06C (1x)
HDMI_Cr(1)	B04B (1x)
HDMI_Cr(1)	B06C (1x)
HDMI_Cr(2)	B04B (1x)
HDMI_Cr(2)	B06C (1x)
HDMI_Cr(3)	B04B (1x)
HDMI_Cr(3)	B06C (1x)
HDMI_Cr(4)	B04B (1x)
HDMI_Cr(4)	B06C (1x)
HDMI_Cr(5)	B04B (1x)
HDMI_Cr(5)	B06C (1x)
HDMI_Cr(6)	B04B (1x)
HDMI_Cr(6)	B06C (1x)
HDMI_Cr(7)	B04B (1x)
HDMI_Cr(7)	B06C (1x)
HDMI_DE	B04B (1x)
HDMI_DE	B06C (1x)
HDMI_H	B04B (1x)
HDMI_H	B06C (1x)
HDMI_HOTPLUG_RESET	B04A (1x)
HDMI_HOTPLUG_RESET	B06C (2x)
HDMI_INT	B04A (1x)
HDMI_INT	B06C (1x)
HDMI_V	B04B (1x)
HDMI_V	B06C (1x)
HDMI_VCLK	B04B (1x)
HDMI_VCLK	B06C (1x)
HDMI_Y(0)	B04B (1x)
HDMI_Y(0)	B06C (1x)
HDMI_Y(0:7)	B04B (1x)
HDMI_Y(0:7)	B06C (1x)
HDMI_Y(1)	B04B (1x)
HDMI_Y(1)	B06C (1x)
HDMI_Y(2)	B04B (1x)
HDMI_Y(2)	B06C (1x)
HDMI_Y(3)	B04B (1x)
HDMI_Y(3)	B06C (1x)
HDMI_Y(4)	B04B (1x)
HDMI_Y(4)	B06C (1x)
HDMI_Y(5)	B04B (1x)
HDMI_Y(5)	B06C (1x)
HDMI_Y(6)	B04B (1x)
HDMI_Y(6)	B06C (1x)
HDMI_Y(7)	B04B (1x)
HDMI_Y(7)	B06C (1x)
HP_AUDIO_OUT_L	B04C (1x)
HP_AUDIO_OUT_L	B06D (1x)
HP_AUDIO_OUT_R	B04C (1x)
HP_AUDIO_OUT_R	B06D (1x)
I2C_LOCAL_SCL	B03B (1x)
I2C_LOCAL_SCL	B03C (1x)
I2C_LOCAL_SCL	B03D (1x)
I2C_LOCAL_SCL	B03E (1x)
I2C_LOCAL_SDA	B03B (1x)
I2C_LOCAL_SDA	B03C (1x)
I2C_LOCAL_SDA	B03D (1x)
I2C_LOCAL_SDA	B03E (1x)
I2C_TDA_SCL	B03A (1x)
I2C_TDA_SCL	B03B (1x)
I2C_TDA_SDA	B03A (1x)
I2C_TDA_SDA	B03B (1x)
IBO_B_IN	B03F (1x)
IBO_B_IN	B04B (1x)
IBO_CVBS_IN	B03F (1x)
IBO_CVBS_IN	B04B (1x)
IBO_G_IN	B03F (1x)
IBO_G_IN	B04B (1x)
IBO_IRQ	B03D (1x)
IBO_IRQ	B04A (1x)
IBO_R_IN	B03F (1x)
IBO_R_IN	B04B (1x)
IF_AGC_IBO	B03A (1x)
IF_AGC_IBO	B03B (1x)
IF_ATV	B03A (2x)
IIC_SCL	B03A (2x)
IIC_SCL	B03D (1x)
IIC_SCL	B04A (1x)
IIC_SCL	B04B (2x)
IIC_SCL	B04C (1x)
IIC_SCL	B06C (1x)
IIC_SCL_up	B04A (2x)
IIC_SDA	B03A (2x)
IIC_SDA	B03D (1x)
IIC_SDA	B04A (1x)
IIC_SDA	B04B (2x)
IIC_SDA	B04C (1x)
IIC_SDA	B06C (1x)
IIC_SDA_up	B04A (2x)
INT	B04A (1x)
INT	B04B (1x)
ISP	B04A (1x)
ITV_SPI_CLK	B04A (2x)
ITV_SPI_DATA_IN	B04A (2x)
JTAG_TCK	B03B (1x)
JTAG_TCK	B03C (1x)
JTAG_TCK	B03D (1x)
JTAG_TMS	B03B (1x)
JTAG_TMS	B03C (1x)
JTAG_TMS	B03D (1x)
JTAG_TRST	B03B (1x)
JTAG_TRST	B03C (1x)
JTAG_TRST	B03D (1x)
KEYB	B04A (2x)
LCD_PWR_ON	B04A (1x)
LCD_PWR_ON	B04B (1x)
LED1	B04A (2x)
LED2	B04A (2x)
LIGHT_SENSOR	B04A (2x)
MIU_ADDR(0)	B03C (1x)
MIU_ADDR(0)	B03D (1x)
MIU_ADDR(0:24)	B03D (1x)
MIU_ADDR(1)	B03C (1x)
MIU_ADDR(1)	B03D (1x)
MIU_ADDR(1)	B03E (1x)
MIU_ADDR(10)	B03D (1x)
MIU_ADDR(10)	B03E (1x)
MIU_ADDR(11)	B03C (1x)
MIU_ADDR(11)	B03D (1x)
MIU_ADDR(11)	B03E (1x)
MIU_ADDR(12)	B03C (1x)
MIU_ADDR(12)	B03D (1x)
MIU_ADDR(12)	B03E (1x)
MIU_ADDR(13)	B03C (1x)
MIU_ADDR(13)	B03D (1x)
MIU_ADDR(13)	B03E (1x)
MIU_ADDR(14)	B03C (1x)
MIU_ADDR(14)	B03D (1x)
MIU_ADDR(14)	B03E (1x)
MIU_ADDR(15)	B03C (1x)
MIU_ADDR(15)	B03D (1x)
MIU_ADDR(15)	B03E (1x)
MIU_ADDR(16)	B03C (1x)
MIU_ADDR(16)	B03D (1x)
MIU_ADDR(16)	B03E (1x)
MIU_ADDR(17)	B03C (1x)
MIU_ADDR(17)	B03D (1x)
MIU_ADDR(17)	B03E (1x)
MIU_ADDR(18)	B03C (1x)
MIU_ADDR(18)	B03D (1x)
MIU_ADDR(18)	B03E (1x)
MIU_ADDR(19)	B03C (1x)
MIU_ADDR(19)	B03D (1x)
MIU_ADDR(19)	B03E (1x)
MIU_ADDR(2)	B03C (1x)
MIU_ADDR(2)	B03D (1x)
MIU_ADDR(2)	B03E (1x)
MIU_ADDR(20)	B03C (1x)
MIU_ADDR(20)	B03D (1x)
MIU_ADDR(20)	B03E (1x)
MIU_ADDR(21)	B03C (1x)
MIU_ADDR(21)	B03D (1x)
MIU_ADDR(21)	B03E (1x)
MIU_ADDR(22)	B03C (1x)
MIU_ADDR(22)	B03D (1x)
MIU_ADDR(22)	B03E (1x)
MIU_ADDR(23)	B03C (1x)
MIU_ADDR(23)	B03D (1x)
MIU_ADDR(24)	B03C (1x)
MIU_ADDR(24)	B03D (1x)
MIU_ADDR(3)	B03C (1x)
MIU_ADDR(3)	B03D (1x)
MIU_ADDR(3)	B03E (1x)
MIU_ADDR(4)	B03C (1x)
MIU_ADDR(4)	B03D (1x)
MIU_ADDR(4)	B03E (1x)
MIU_ADDR(5)	B03C (1x)
MIU_ADDR(5)	B03D (1x)
MIU_ADDR(5)	B03E (1x)
MIU_ADDR(6)	B03C (1x)
MIU_ADDR(6)	B03D (1x)
MIU_ADDR(6)	B03E (1x)
MIU_ADDR(7)	B03C (1x)
MIU_ADDR(7)	B03D (1x)
MIU_ADDR(7)	B03E (1x)
MIU_ADDR(8)	B03C (1x)
MIU_ADDR(8)	B03D (1x)
MIU_ADDR(8)	B03E (1x)
MIU_ADDR(9)	B03C (1x)
MIU_ADDR(9)	B03D (1x)
MIU_ADDR(9)	B03E (1x)
MIU_DATA(0)	B03C (1x)
MIU_DATA(0)	B03D (1x)
MIU_DATA(0)	B03E (1x)
MIU_DATA(0:15)	B03D (1x)
MIU_DATA(0:15)	B03E (1x)
MIU_DATA(1)	B03C (1x)
MIU_DATA(1)	B03D (1x)
MIU_DATA(1)	B03E (1x)
MIU_DATA(10)	B03D (1x)
MIU_DATA(10)	B03E (1x)
MIU_DATA(11)	B03D (1x)
MIU_DATA(11)	B03E (1x)
MIU_DATA(12)	B03D (1x)
MIU_DATA(12)	B03E (1x)
MIU_DATA(13)	B03D (1x)
MIU_DATA(13)	B03E (1x)
MIU_DATA(14)	B03D (1x)
MIU_DATA(14)	B03E (1x)
MIU_DATA(15)	B03D (1x)
MIU_DATA(15)	B03E (1x)
MIU_DATA(2)	B03D (1x)
MIU_DATA(2)	B03E (1x)
MIU_DATA(3)	B03C (1x)
MIU_DATA(3)	B03D (1x)
MIU_DATA(3)	B03E (1x)
MIU_DATA(4)	B03C (1x)
MIU_DATA(4)	B03D (1x)
MIU_DATA(4)	B03E (1x)
MIU_DATA(5)	B03C (1x)
MIU_DATA(5)	B03D (1x)
MIU_DATA(5)	B03E (1x)
MIU_DATA(6)	B03C (1x)
MIU_DATA(6)	B03D (1x)
MIU_DATA(6)	B03E (1x)
MIU_DATA(7)	B03C (1x)
MIU_DATA(7)	B03D (1x)
MIU_DATA(7)	B03E (1x)
MIU_DATA(8)	B03C (1x)
MIU_DATA(8)	B03D (1x)
MIU_DATA(8)	B03E (1x)
MIU_DATA(9)	B03C (1x)
MIU_DATA(9)	B03D (1x)
MIU_DATA(9)	B03E (1x)
MIU_OEN	B03C (1x)
MIU_OEN	B03D (1x)
MIU_OEN	B03E (1x)
MIU_RDY	B03C (1x)
MIU_RDY	B03D (1x)
MIU_WEN	B03C (1x)
MIU_WEN	B03D (1x)
MIU_WEN	B03E (1x)
MOJO_I2S_OUT_SCK	B03D (1x)
MOJO_I2S_OUT_SCK	B04C (1x)
MOJO_I2S_OUT_SD	B03D (1x)
MOJO_I2S_OUT_SD	B04C (1x)
MOJO_I2S_OUT_WS	B03D (1x)
MOJO_I2S_OUT_WS	B04C (1x)
MUTEn	B04A (1x)
MUTEn	B06D (1x)
NOR_CS	B03D (1x)
NOR_CS	B03E (1x)
NOR_RYBY	B03D (1x)
NOR_RYBY	B03E (1x)
NOR_WP	B03D (1x)
NOR_WP	B03E (1x)
PCMCIA_5V	B03C (4x)
PCMCIA_AVCC	B03C (3x)
PCMCIA_VPP	B03C (3x)
POWER_DOWN	B02 (1x)
POWER_DOWN	B04A (1x)
POWER_DOWN	B06D (1x)
RD	B04A (1x)
RD	B04B (1x)
REMOTE	B04A (3x)
RESET_FE_n	B03B (1x)
RESET_FE_n	B03D (1x)
RESET_n	B03D (1x)
RESET_n	B03E (1x)
RESET_STV	B03C (1x)
RESET_STV	B03D (1x)
RF_AGC	B03A (2x)
RF_AGC_IBO	B03A (1x)
RF_AGC_IBO	B03B (1x)
RST	B04A (1x)
RST	B06C (1x)
RST_AUD	B04A (1x)
RST_AUD	B04C (1x)
RST_H	B04A (1x)
RST_H	B04B (1x)
RXD0	B03D (1x)
RXD0	B03F (1x)
SAW_SW	B03A (1x)
SAW_SW	B04A (1x)
SC1_AUDIO_IN_L	B04C (1x)
SC1_AUDIO_IN_L	B06B (1x)
SC1_AUDIO_IN_R	B04C (1x)
SC1_AUDIO_IN_R	B06B (1x)
SC1_AUDIO_MUTE_L	B06B (1x)
SC1_AUDIO_MUTE_L	B06D (1x)
SC1_AUDIO_MUTE_R	B06B (1x)
SC1_AUDIO_MUTE_R	B06D (1x)
SC1_AUDIO_OUT_L	B04C (1x)
SC1_AUDIO_OUT_L	B06B (2x)
SC1_AUDIO_OUT_R	B04C (1x)
SC1_AUDIO_OUT_R	B06B (2x)
SC1_B_IN	B04B (1x)
SC1_B_IN	B06B (2x)
SC1_CVBS_IN	B04B (1x)
SC1_CVBS_IN	B06B (1x)
SC1_CVBS_RF_OUT	B04A (1x)
SC1_CVBS_RF_OUT	B06B (1x)
SC1_FBL_IN	B04B (1x)
SC1_FBL_IN	B06B (2x)
SC1_G_IN	B04B (1x)
SC1_G_IN	B06B (2x)
SC1_R_IN	B04B (1x)
SC1_R_IN	B06B (2x)
SC1_RF_OUT_CVBS	B04B (1x)
SC1_RF_OUT_CVBS	B06B (1x)
SC1_STATUS	B04A (1x)
SC1_STATUS	B06B (1x)
SC2_AUDIO_IN_L	B04C (1x)
SC2_AUDIO_IN_L	B06B (2x)
SC2_AUDIO_IN_R	B04C (1x)
SC2_AUDIO_IN_R	B06B (2x)
SC2_AUDIO_MUTE_L	B06B (1x)
SC2_AUDIO_MUTE_L	B06D (1x)
SC2_AUDIO_MUTE_R	B06B (1x)
SC2_AUDIO_MUTE_R	B06D (1x)
SC2_AUDIO_OUT_L	B04C (1x)
SC2_AUDIO_OUT_L	B06B (1x)
SC2_AUDIO_OUT_R	B04C (1x)
SC2_AUDIO_OUT_R	B06B (1x)
SC2_C_IN	B04B (1x)
SC2_C_IN	B06B (2x)
SC2_CVBS_MON_OUT	B04B (1x)
SC2_CVBS_MON_OUT	B06B (1x)
SC2_CVBS_MON_OUT	B06D (1x)
SC2_STATUS	B04A (1x)
SC2_STATUS	B06B (1x)
SC2_Y_CVBS_IN	B04B (1x)
SC2_Y_CVBS_IN	B06B (2x)
SDRAM_ADDR(0)	B03D (1x)
SDRAM_ADDR(0)	B03E (1x)
SDRAM_ADDR(0:14)	B03D (1x)
SDRAM_ADDR(1)	B03D (1x)
SDRAM_ADDR(1)	B03E (1x)
SDRAM_ADDR(10)	B03D (1x)
SDRAM_ADDR(10)	B03E (1x)
SDRAM_ADDR(11)	B03D (1x)
SDRAM_ADDR(11)	B03E (1x)
SDRAM_ADDR(12)	B03D (1x)
SDRAM_ADDR(12)	B03E (1x)
SDRAM_ADDR(13)	B03D (1x)
SDRAM_ADDR(13)	B03E (1x)
SDRAM_ADDR(14)	B03D (1x)
SDRAM_ADDR(14)	B03E (1x)
SDRAM_ADDR(2)	B03D (1x)
SDRAM_ADDR(2)	B03E (1x)
SDRAM_ADDR(3)	B03D (1x)
SDRAM_ADDR(3)	B03E (1x)
SDRAM_ADDR(4)	B03D (1x)
SDRAM_ADDR(4)	B03E (1x)
SDRAM_ADDR(5)	B03D (1x)
SDRAM_ADDR(5)	B03E (1x)
SDRAM_ADDR(6)	B03D (1x)
SDRAM_ADDR(6)	B03E (1x)
SDRAM_ADDR(7)	B03D (1x)
SDRAM_ADDR(7)	B03E (1x)
SDRAM_ADDR(8)	B03D (1x)
SDRAM_ADDR(8)	B03E (1x)
SDRAM_ADDR(9)	B03D (1x)
SDRAM_ADDR(9)	B03E (1x)
SDRAM_DQM0	B03D (1x)
SDRAM_DQM0	B03E (1x)
SDRAM_DQM1	B03D (1x)
SDRAM_DQM1	B03E (1x)
SDRAM_RAS	B03D (1x)
SDRAM_RAS	B03E (1x)
SDRAM_WE	B03D (1x)
SDRAM_WE	B03E (1x)
SIDE_AUDIO_IN_L	B04C (1x)
SIDE_AUDIO_IN_L	B06A (1x)
SIDE_AUDIO_IN_R	B04C (1x)
SIDE_AUDIO_IN_R	B06A (1x)
SIF	B03A (1x)
SIF	B04C (1x)
SIF1	B03A (2x)
SIF2	B03A (2x)
STANDBY	B02 (2x)
STANDBY	B04A (2x)
STANDBY	B06D (1x)
STANDBYn	B04A (1x)
STANDBYn	B04B (1x)
STANDBYn	B07 (1x)
STV_A25	B03C (1x)
STV_A25	B03D (1x)
STV_CS	B03C (1x)
STV_CS	B03D (1x)
STV_INT	B03C (1x)
STV_INT	B03D (1x)
STV_TDO	B03B (1x)
STV_TDO	B03C (1x)
TDA_CLK	B03B (1x)
TDA_CLK	B03C (1x)
TDA_DAT(0)	B03B (1x)
TDA_DAT(0)	B03C (1x)
TDA_DAT(0:7)	B03B (1x)
TDA_DAT(1)	B03B (1x)
TDA_DAT(1)	B03C (1x)
TDA_DAT(2)	B03B (1x)
TDA_DAT(2)	B03C (1x)
TDA_DAT(3)	B03B (1x)
TDA_DAT(3)	B03C (1x)
TDA_DAT(4)	B03B (1x)
TDA_DAT(4)	B03C (1x)
TDA_DAT(5)	B03B (1x)
TDA_DAT(5)	B03C (1x)
TDA_DAT(6)	B03B (1x)
TDA_DAT(6)	B03C (1x)
TDA_DAT(7)	B03B (1x)
TDA_DAT(7)	B03C (1x)
TDA_SYNC	B03B (1x)
TDA_SYNC	B03C (1x)
TDA_VALID	B03B (1x)
TDA_VALID	B03C (1x)
TS_CLK	B03C (1x)
TS_CLK	B03D (1x)
TS_DATA(0)	B03C (1x)
TS_DATA(0)	B03D (1x)
TS_DATA(0:7)	B03D (1x)
TS_DATA(1)	B03C (1x)
TS_DATA(1)	B03D (1x)
TS_DATA(2)	B03C (1x)
TS_DATA(2)	B03D (1x)
TS_DATA(3)	B03C (1x)
TS_DATA(3)	B03D (1x)
TS_DATA(4)	B03C (1x)
TS_DATA(4)	B03D (1x)
TS_DATA(5)	B03C (1x)
TS_DATA(5)	B03D (1x)
TS_DATA(6)	B03C (1x)
TS_DATA(6)	B03D (1x)
TS_DATA(7)	B03C (1x)
TS_DATA(7)	B03D (1x)
TS_SYNC	B03C (1x)
TS_SYNC	B03D (1x)
TS_VALID	B03C (1x)
TS_VALID	B03D (1x)
TXAn	B04B (2x)
TXAp	B04B (2x)
TXBn	B04B (2x)
TXBp	B04B (2x)
TXCLKn	B04B (2x)
TXCLKp	B04B (2x)
TXCn	B04B (2x)
TXCp	B04B (2x)
TXD0	B03D (1x)
TXD0	B03F (1x)
TXDn	B04B (2x)
TXDp	B04B (2x)
user_EEPROM_WP	B03D (1x)
user_EEPROM_WP	B03E (1x)
VCCEN	B03C (1x)
VDD	B07 (3x)
VDDA	B07 (2x)
VDISP	B04B (2x)
VGA_H	B04B (1x)
VGA_H	B06A (1x)
VGA_V	B04B (1x)
VGA_V	B06A (1x)
VIF1	B03A (2x)
VIF2	B03A (2x)
VIM_IBO	B03A (1x)
VIM_IBO	B03B (1x)
VIP_IBO	B03A (1x)
VIP_IBO	B03B (1x)
VSS	B07 (3x)
VSSA	B07 (5x)
WR	B04A (1x)
WR	B04B (1x)

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Layout Small Signal Board (Overview Top Side)

1101 E3 1102 E6 1103 E6 1104 D6 1201 D7 1210 A7 1211 A7 1212 A7 1213 A7 1214 A7 1301 B6 1304 A9 1305 A8 1306 A8
1307 A8 1308 A8 1309 D8 1310 A8 1311 A5 1312 B5 1500 E10 1501 E10 1502 E9 1503 E10 1504 D9 1505 E9 1506 D10 1507 E9
1508 D10 1509 D9 1510 D10 1511 D9 1512 D9 1513 D10 1514 D10 1515 D10 1516 D9 1517 D9 1518 C10 1519 D9 1520 D9 1521 C10
1522 D9 1523 C9 1524 C9 1525 B10 1526 F10 1601 F6 1603 F6 1606 F10 1607 F10 1608 F6 1609 F6 1610 F9 1611 F9 1612 F6
1613 F9 1614 F6 1615 F9 1618 F6 1619 F10 1735 A10 1810 F7 1811 F8 1823 E6 1900 B9 1901 B10 1902 B10 1903 A8 1904 A8
1G04 B2 1G50 A7 1G51 A7 1K00 E5 1M20 A8 1P11 A5 2110 E6 2111 E6 2114 E6 2117 E6 2123 D6 2127 D6 2128 D6 2129 D6
2134 D6 2135 D6 2138 D6 2142 E5 2143 D6 2144 D6 2151 D5 2208 A6 2209 A6 2211 C6 2212 C6 2214 C6 2215 C6 2216 C6
2242 C6 2243 C6 2246 D7 2247 D7 2250 D7 2251 D7 2252 D7 2253 D7 2254 D7 2255 D7 2256 D7 2257 D7 2259 D7 2260 D7
2261 D7 2262 A7 2263 A7 2264 A7 2265 A7 2267 D7 2268 D6 2273 D6 2277 D7 2283 A7 2285 A7 2301 A8 2311 A8 2314 B6
2315 A6 2316 B6 2317 B6 2318 B8 2319 B8 2327 A8 2328 A8 2329 A8 2330 A8 2331 A8 2332 A8 2333 A8 2334 A8 2335 A8
2336 A8 2337 A8 2339 A8 2340 A8 2408 B8 2409 B8 2410 B8 2411 C8 2412 C8 2413 C8 2414 C8 2417 C8 2418 C8 2419 C8
2420 B8 2421 C8 2422 C8 2423 B8 2432 C8 2433 C8 2434 C8 2435 C8 2436 C8 2437 C8 2438 C8 2439 B8 2440 B8 2441 C8
2442 C8 2443 C8 2444 C7 2445 C8 2446 C8 2447 C8 2600 F6 2601 F6 2609 F6 2613 E6 2614 E6 2615 F6 2616 F6 2617 F6
2801 F8 2802 F8 2805 F9 2806 E9 2807 F9 2808 F9 2809 F7 2810 F7 2811 E9 2812 E9 2813 E8 2814 E9 2815 E9 2828 E8
2901 B9 2902 B9 2903 B9 2906 B9 2907 B9 2909 B10 2910 B10 2911 B10 2912 B10 2940 B10 2A01 A9 2A02 A9 2A04 B9
2A08 A9 2A09 A9 2A10 B9 2A11 A9 2A12 A9 2A13 A10 2A14 A10 2A15 A8 2A16 B8 2A17 A10 2A18 A9 2A19 B9 2A20 B8
2A22 B9 2A23 A10 2A24 B9 2A26 A10 2A28 A10 2A29 B9 2A30 A9 2A32 B9 2A33 A9 2A34 A9 2A37 A10 2A38 A10 2A40 A9
2A41 A9 2B10 B4 2B11 B4 2B12 B3 2B13 B4 2B15 A3 2B16 B3 2B18 C5 2B19 B5 2B20 B5 2B21 D5 2B22 A3 2B23 D3 2B26 C3
2C55 A3 2C56 A3 2C57 A3 2C58 A5 2C59 A4 2C60 A3 2C61 A3 2F10 D3 2F11 D3 2F12 F3 2F13 F3 2F20 D3 2F22 E3 2G02 C3
2G17 B1 2G18 C1 2G22 D3 2G23 D1 2G33 B2 2G34 C1 2H06 C3 2H07 D1 2H08 D3 2J01 B1 2J04 D3 2J05 D3 2J06 D3 2K06 F1
2K07 E1 2K11 D3 2K13 D3 2K14 F2 2K16 F3 2K17 F3 2L20 A9 2L21 A8 2L22 A8 2L23 A8 2L24 A9 2L25 A9 2L26 A9 2L27 A9
2L28 A9 2L29 A9 2L30 A9 2L31 A9 2L32 A9 2L33 A9 3113 E6 3117 E6 3118 E6 3119 E6 3122 E6 3125 D6 3126 D6 3130 D5
3133 D6 3135 D6 3170 D6 3171 D6 3172 D6 3173 D6 3174 D6 3175 D6 3176 D6 3177 D6 3178 D6 3179 D6 3180 D6 3181 D6
3182 D6 3183 D6 3184 D6 3185 D6 3186 D6 3187 D6 3188 D6 3189 D6 3190 D6 3191 D6 3192 D6 3193 D6 3194 D6 3195 D6
3196 D6 3197 D6 3198 D6 3199 D6 3200 D6 3201 B7 3202 B7 3203 B7 3204 B7 3205 B7 3206 B7 3207 B7 3208 B7 3209 B7
3210 B7 3211 B7 3212 B7 3213 B7 3214 B7 3215 B7 3216 A6 3217 A6 3218 A6 3219 A6 3220 A6 3221 A6 3222 A6 3223 A7
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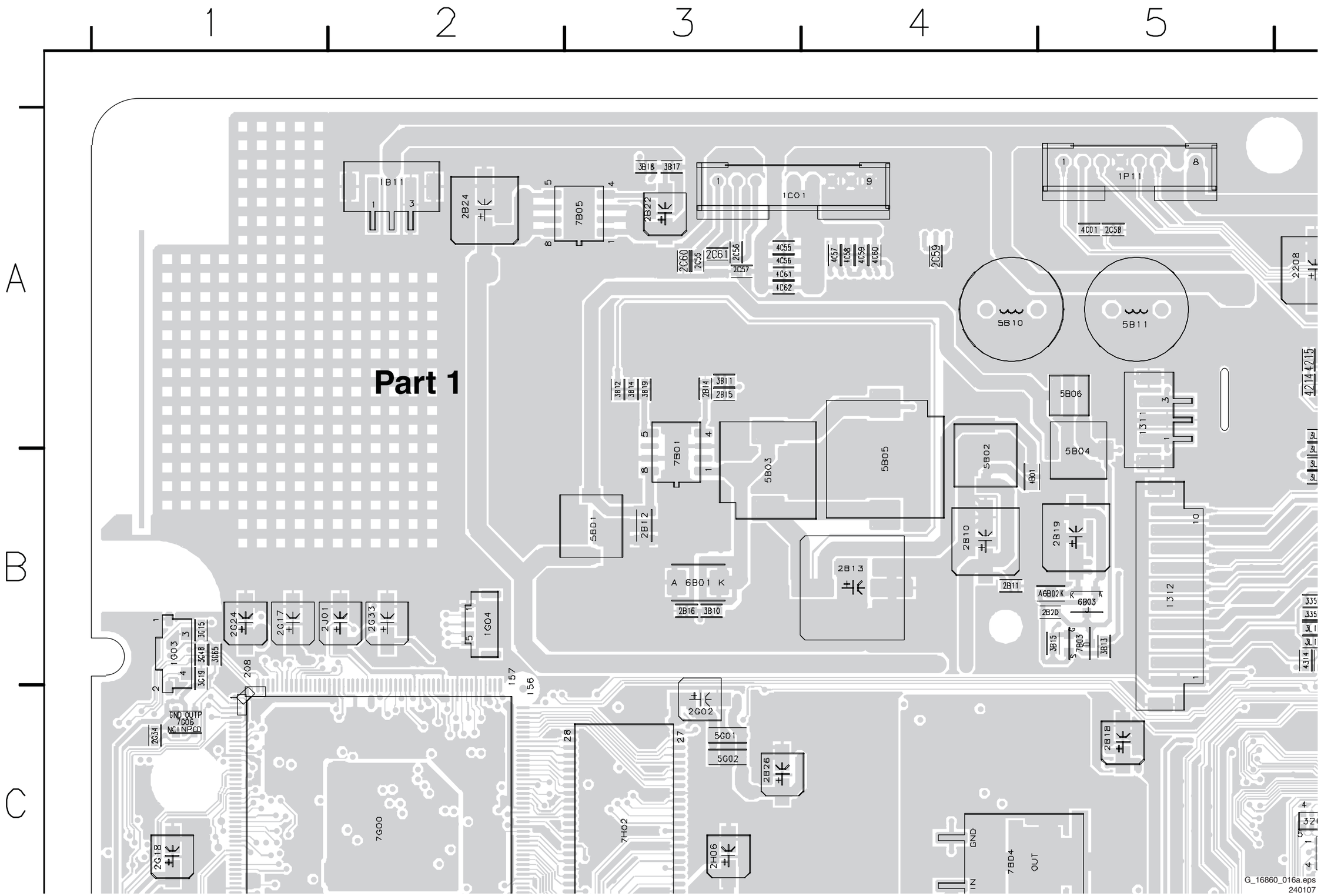

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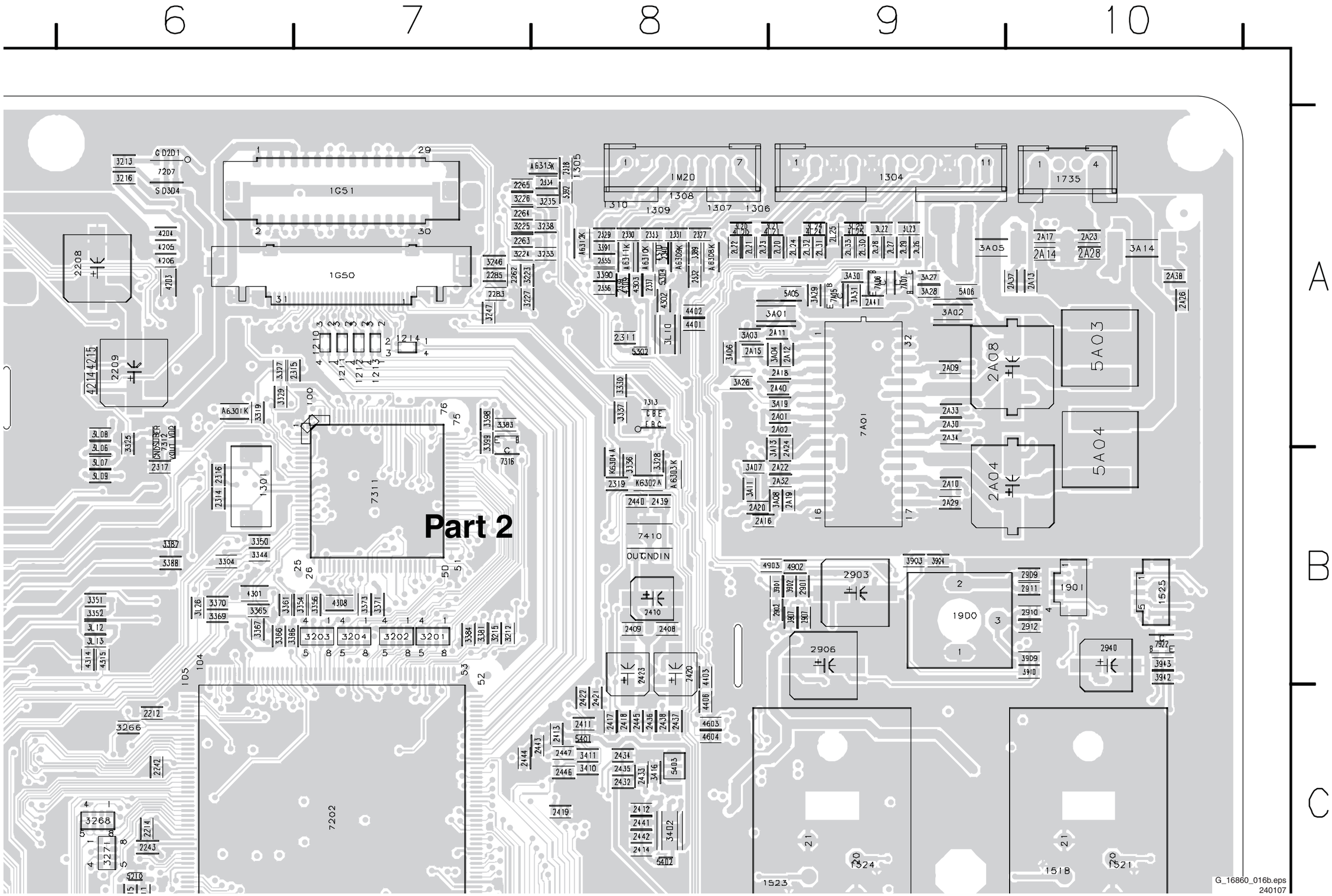

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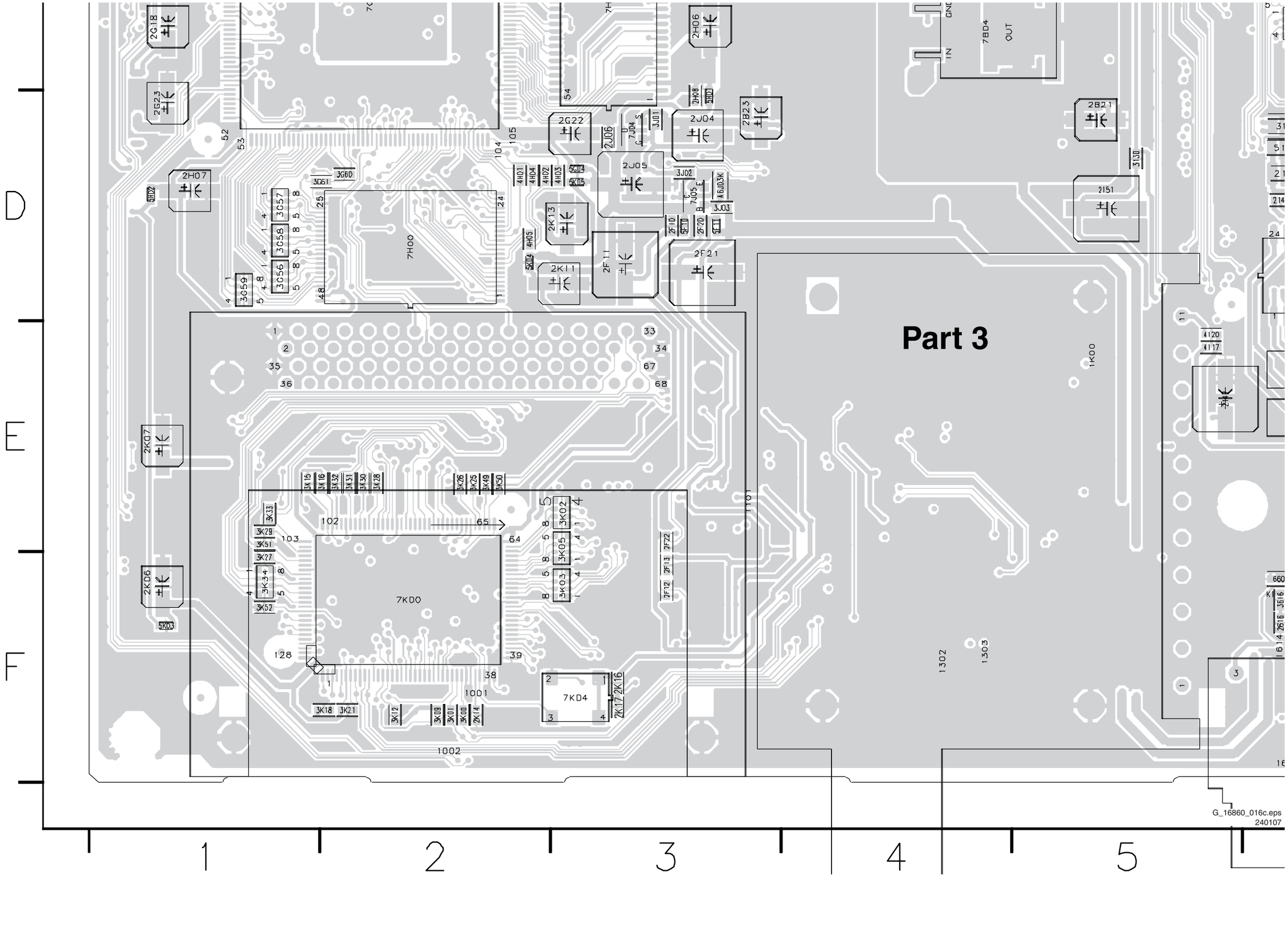

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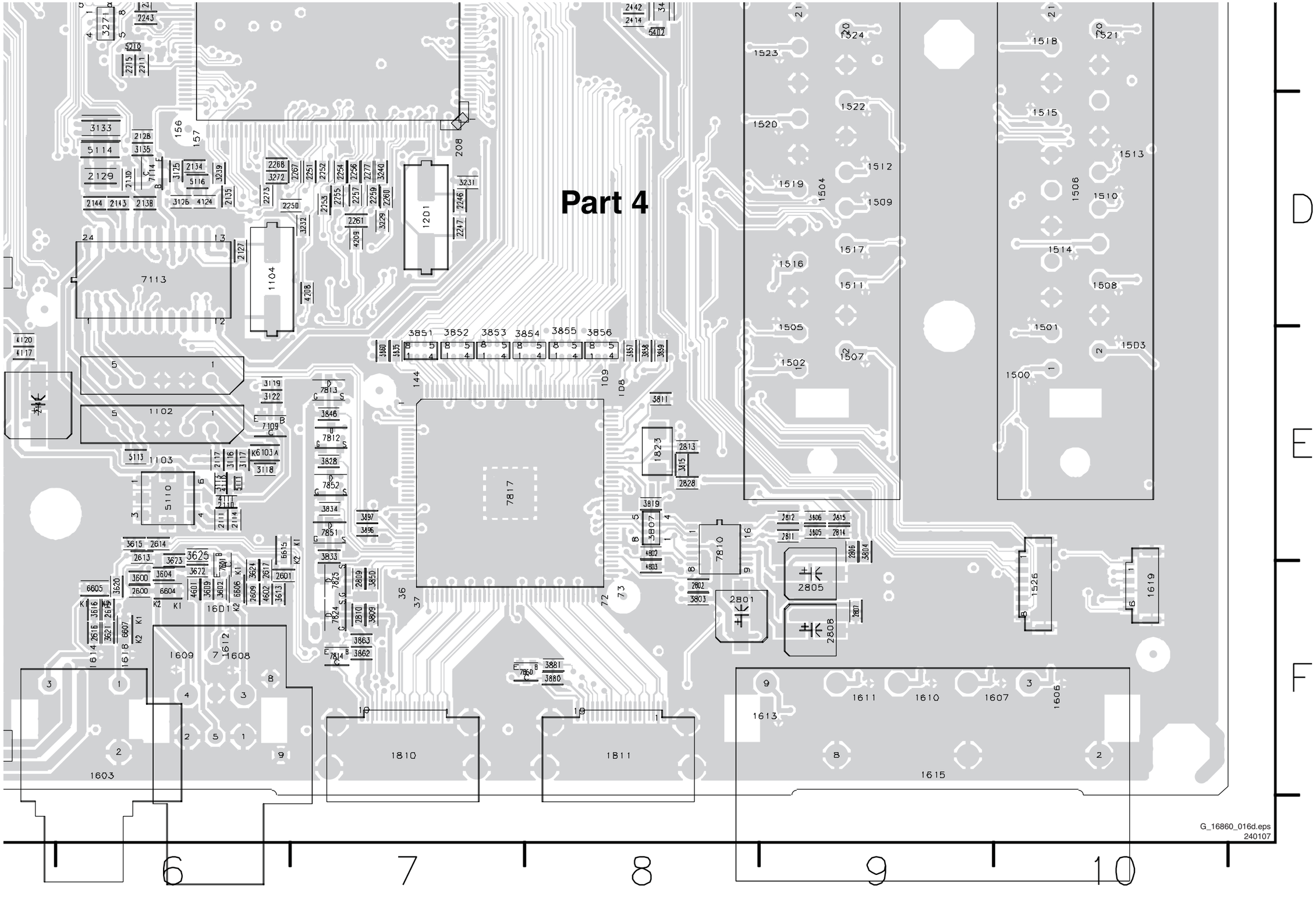

Layout Small Signal Board (Overview Bottom Side)

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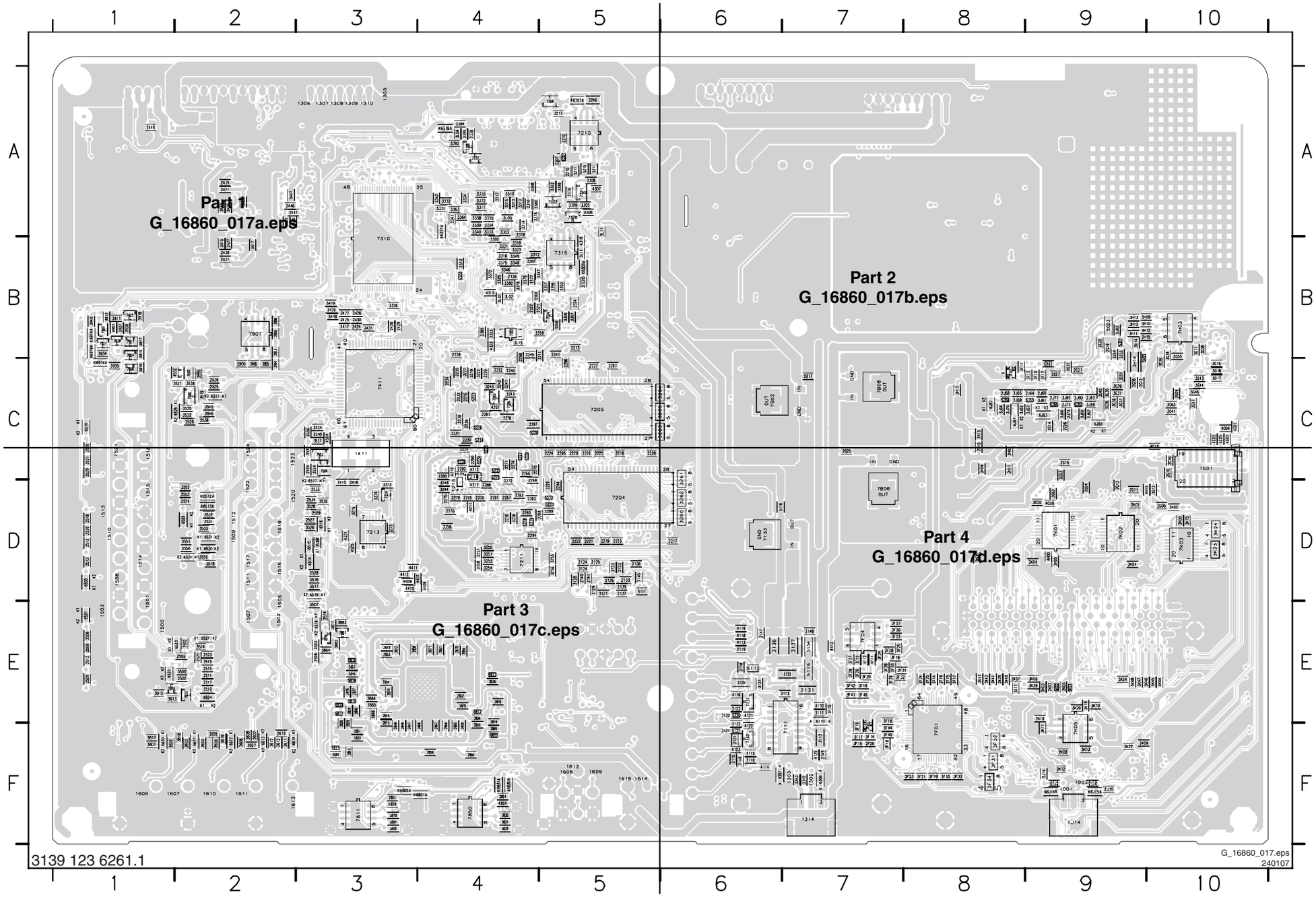

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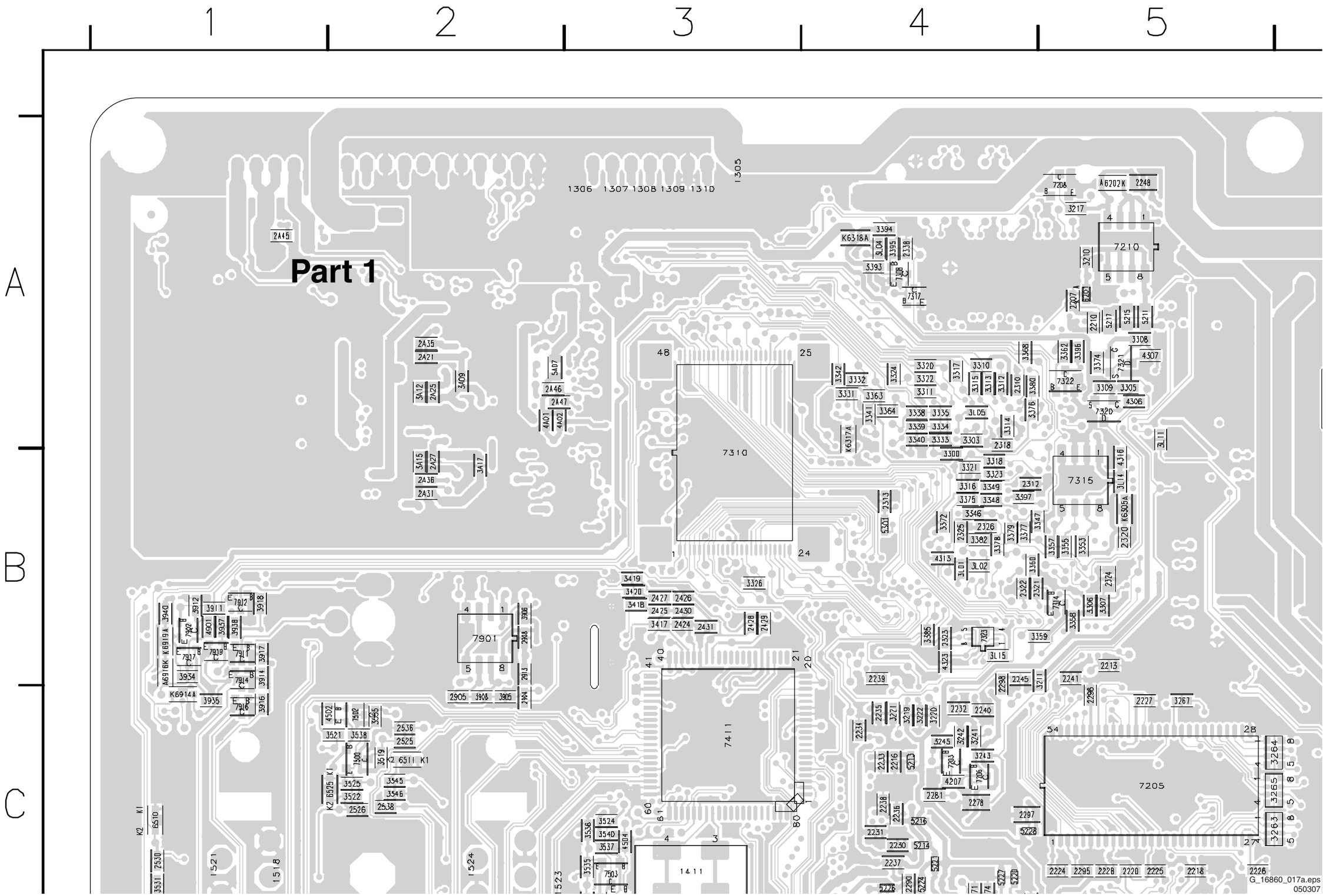

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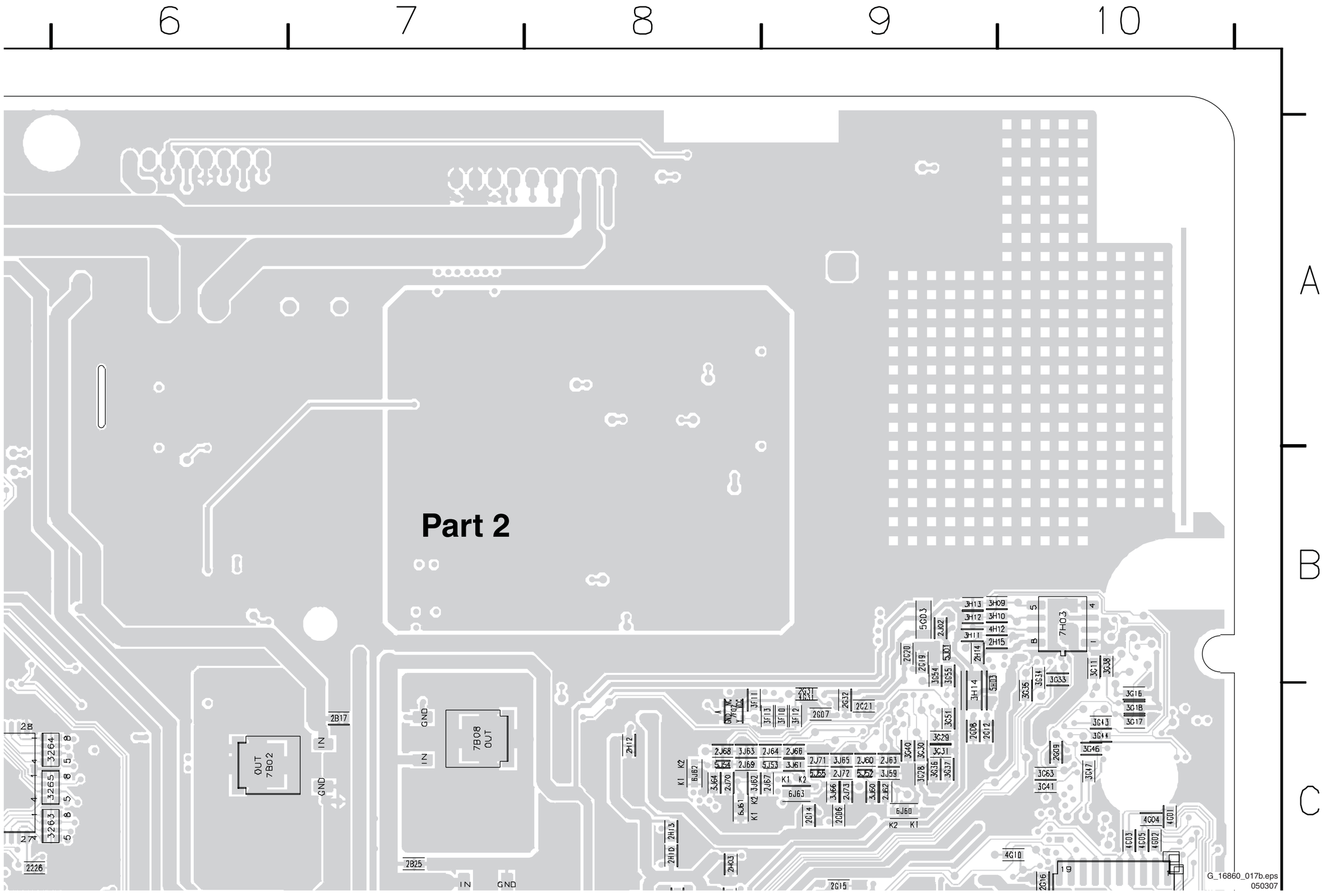

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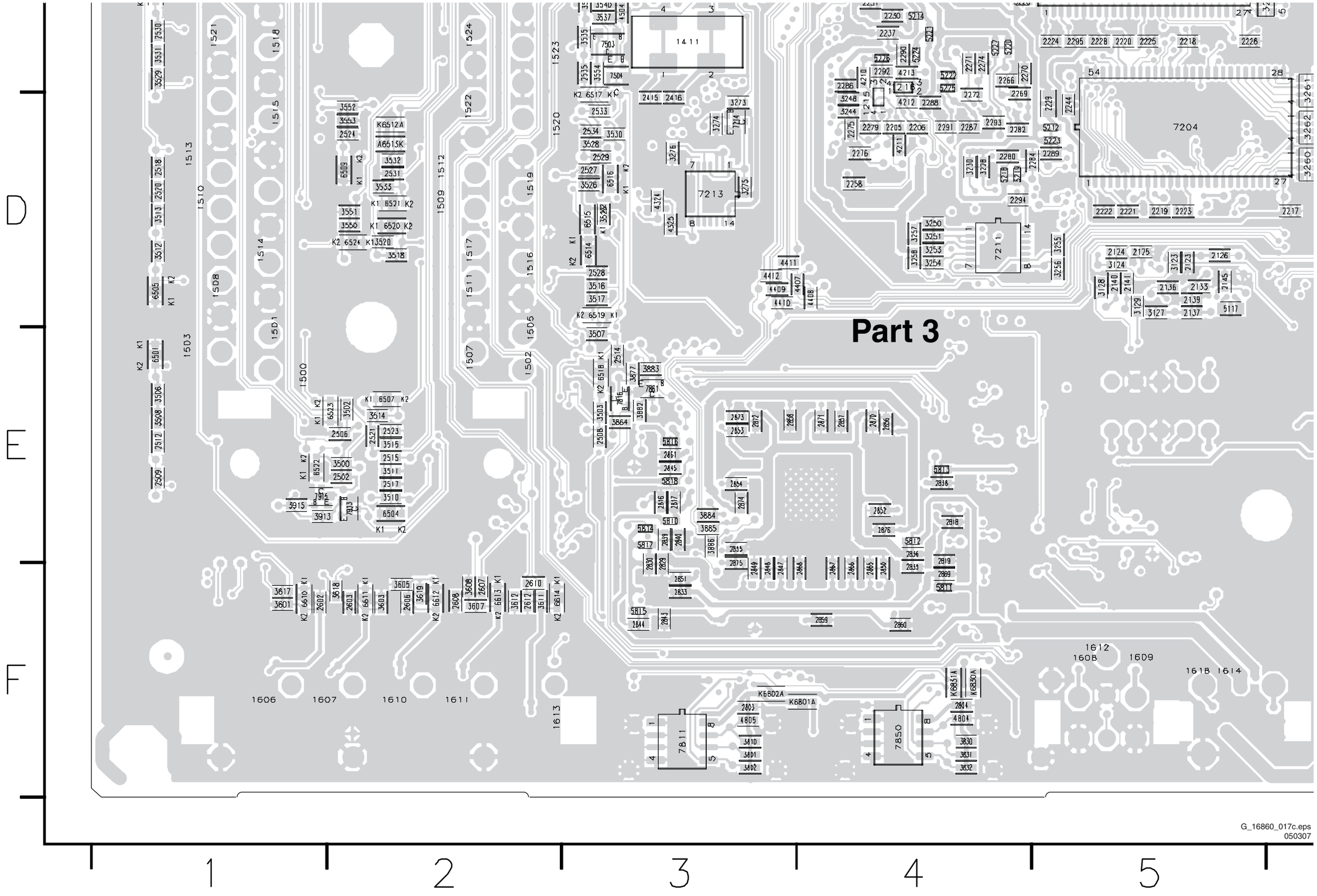

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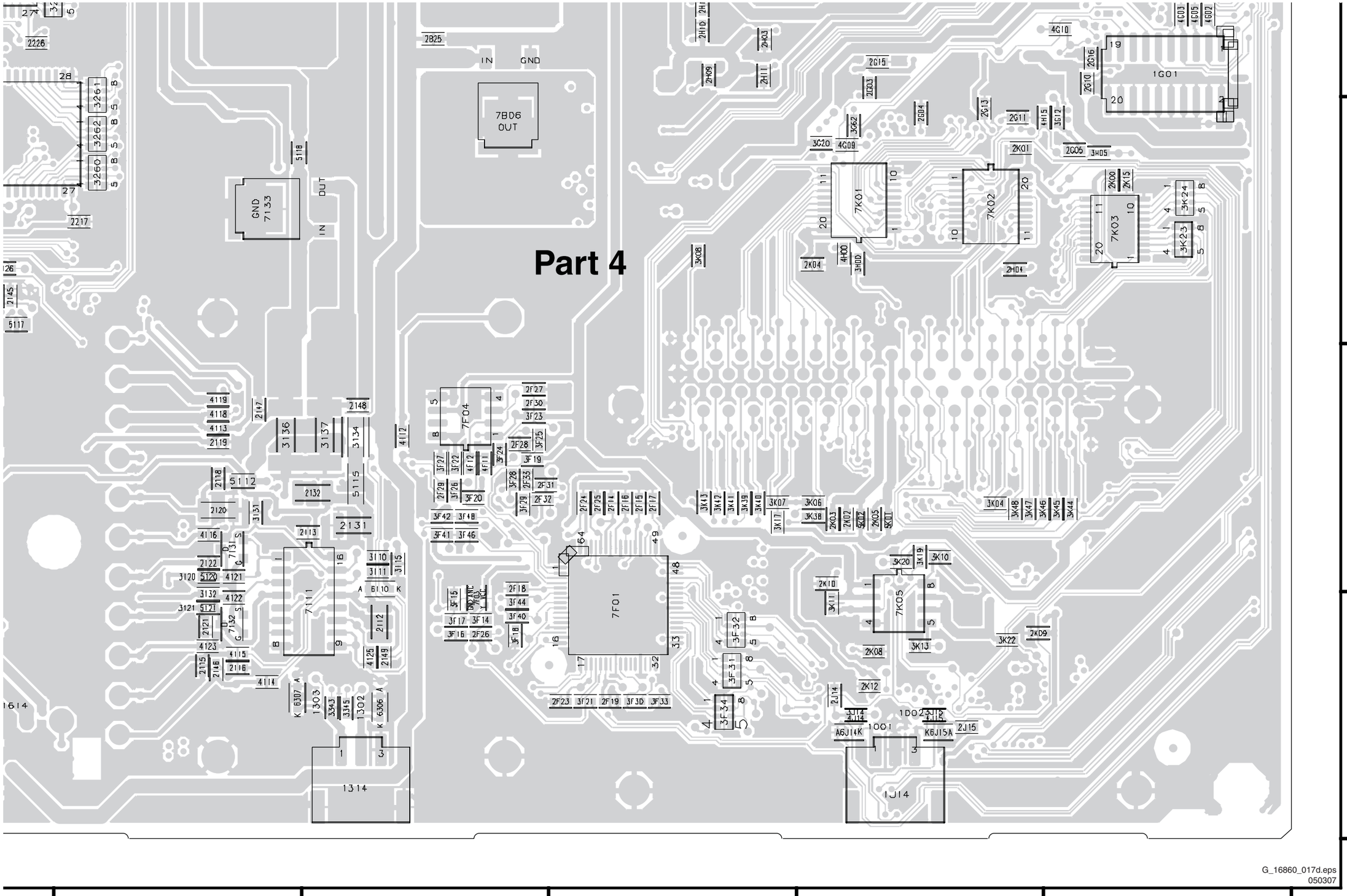
Layout Small Signal Board (Part 4 Bottom Side)

Part 4



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Side A/V Panel

SIDE FACING SIDE AV

SVHS
1301
YKF51-5564
Y_CVBS
C
S302
S301
2303 22p
6301 DF3A6.8
I303
6302 DF3A6.8
3303 10R
3302 75R
2301 47p
2302 47p
3304 100R
4304
3301 75R
3305 10R
3306 100R
4306
2304 47p
3307 100R
4307
CVBS
YELLOW
1302-1 1
I306
S303
2311 22p
6303 DF3A6.8
L
WHITE
1302-2 4
4301
4302
I308
S304
3308 **
2313 **
3314 **
3309 **
2305 **
6304 DF3A6.8
R
RED
1302-3 7
I309
S305
3310 **
2314 **
3315 **
3311 **
2306 **
6305 DF3A6.8
HEADPHONE
1303
YKB21-5101A
I311
I312
4308
4309
S306
S307
S308
2307 22n
2308 22n
2309 10n
2310 10n
3312 10K
3313 10K
6306 DF3A6.8
6307 DF3A6.8

TO 1M36 OF BJ/EBJ SSB
B
1304
I321
I314 FRONT_Y_CVBS_IN
I315 FRONT_C_IN
I316 L_FRONT_IN
I317 FRONT_DETECT
I318 R_FRONT_IN
I319 HEAD_PH_L
I320 HEAD_PH_R

1310
B3B-PH-K

TO 1H01 OF BJ SSB /
TO 1M60 OF EBJ SSB
B
1309
B5B-PH-K
I330
I331
I332
5300
4310
4311
220R
2312 100u 16V
I325
I326
I327
I328
1308
292303-4
USB
S310
S311
S312
4303

** DIVERSITY TABLE

	EBJ 2K7	BJ 2K7	LC07
2305	100p	100p	1n
2306	100p	100p	1n
2313	NA	680p	1n
2314	NA	680p	1n
3314	NA	33K	NA
3315	NA	33K	NA
3308	100R	1K	150R
3310	100R	1K	150R
3309	100K	NA	33K
3311	100K	NA	33K

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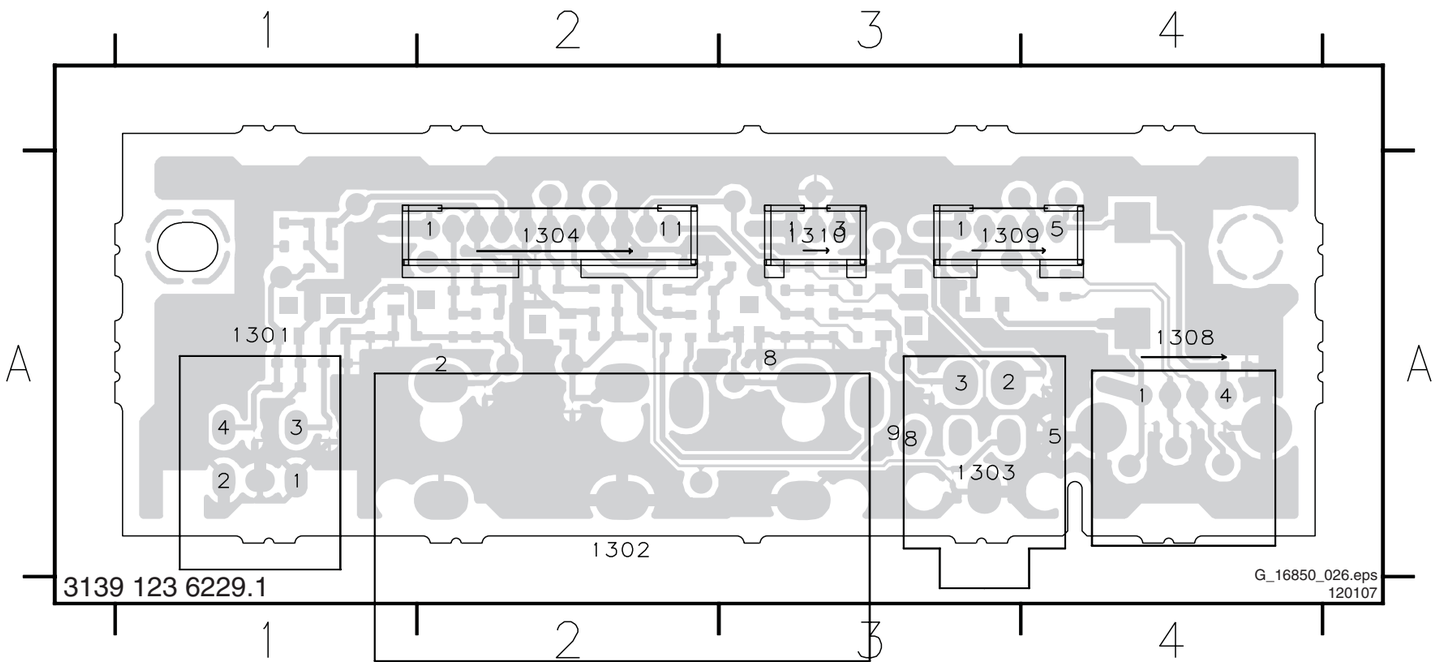
1301 A1 S307 F2
1302-1 C1 S308 F2
1302-2 D1 S310 E8
1302-3 E1 S311 E8
1303 E1 S312 E8
1304 B9
1308 D9
1309 D7
1310 D9
2301 A4
2302 A4
2303 A2
2304 B4
2305 D4
2306 E4
2307 F4
2308 F4
2309 F4
2310 F4
2311 C2
2312 D8
2313 D3
2314 E3
3301 B2
3302 A4
3303 A4
3304 A5
3305 B4
3306 B5
3307 C5
3308 D4
3309 D4
3310 E4
3311 E4
3312 F5
3313 F5
3314 D4
3315 E4
4301 D2
4302 D2
4303 E8
4304 A5
4306 B5
4307 C5
4308 F4
4309 F4
4310 E7
4311 E7
5300 D7
6301 B3
6302 B3
6303 C3
6304 D3
6305 E3
6306 F3
6307 F3
I303 A3
I306 C2
I308 D2
I309 E2
I311 F2
I312 F2
I314 B7
I315 B7
I316 B7
I317 B7
I318 C7
I319 C7
I320 C7
I321 B9
I325 D8
I326 D8
I327 E8
I328 E8
I330 D7
I331 D7
I332 E7
S301 A2
S302 A2
S303 C2
S304 D2
S305 E2
S306 F2

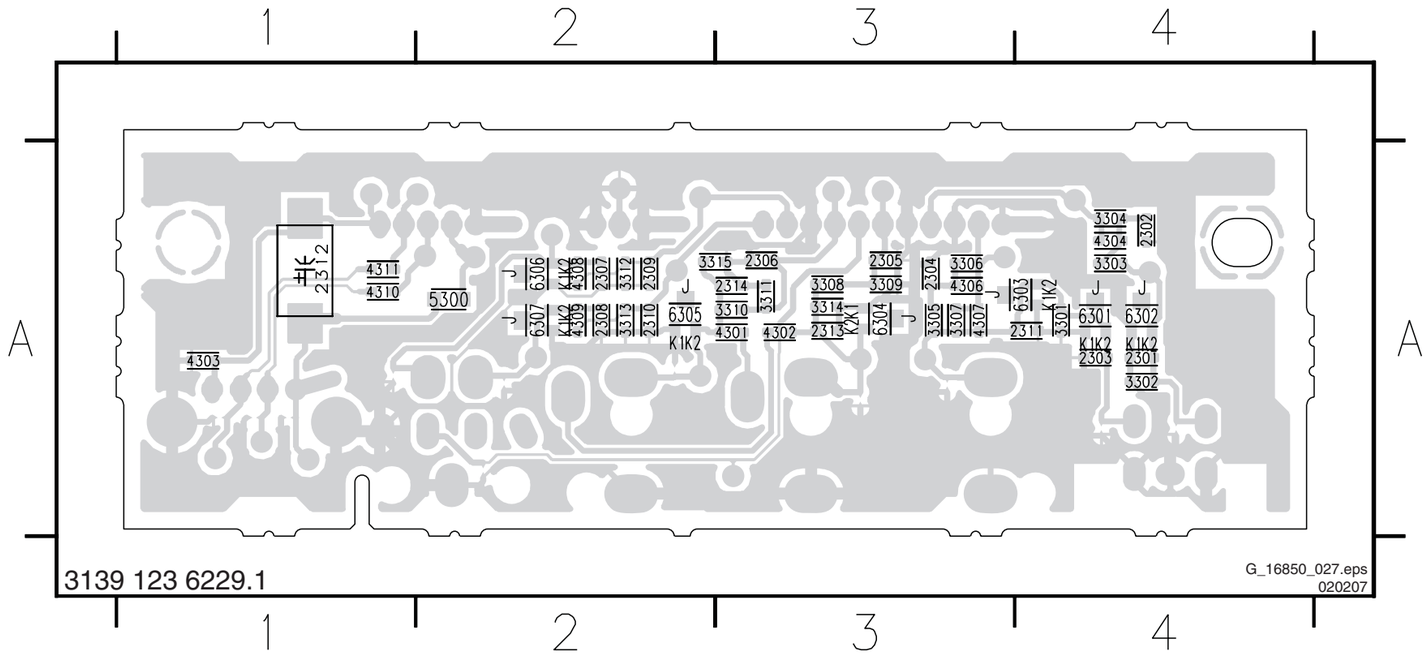
Layout Side A/V Panel (Top Side)

1301 A1 1302 A2 1303 A3 1304 A2 1308 A4 1309 A3 1310 A3

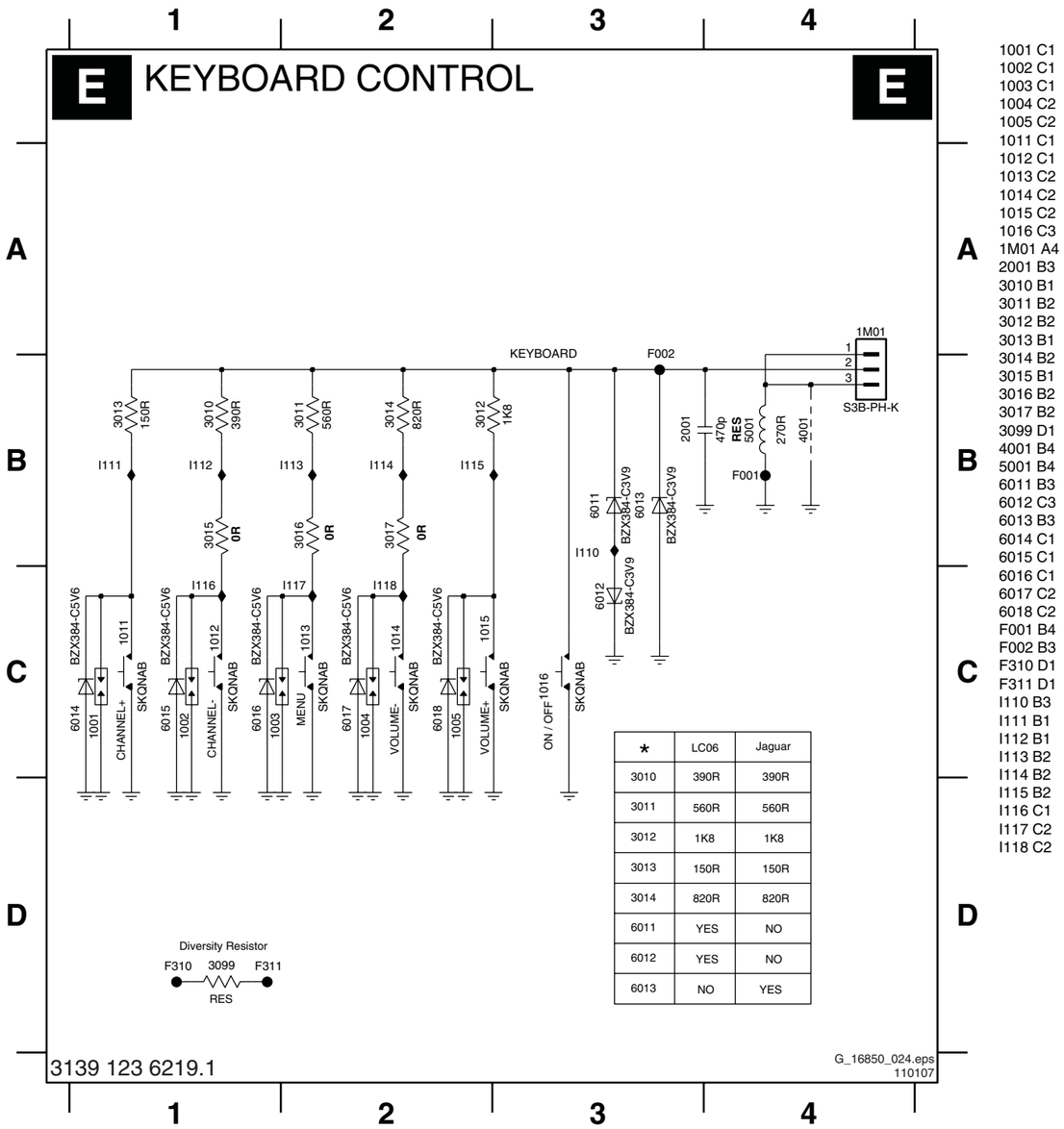


Layout Side A/V Panel (Bottom Side)

2301	A4	2307	A2	2313	A3	3305	A3	3311	A3	4302	A3	4309	A2	6303	A4				
2302	A4	2308	A2	2314	A3	3306	A3	3312	A2	4303	A1	4310	A1	6304	A3				
2303	A4	2309	A2	3301	A4	3307	A3	3313	A2	4304	A4	4311	A1	6305	A2				
2304	A3	2310	A2	3302	A4	3308	A3	3314	A3	4306	A3	5300	A2	6306	A2				
2305	A3	2311	A4	3303	A4	3309	A3	3315	A3	4307	A3	6301	A4	6307	A2				
2306	A3	2312	A1	3304	A4	3310	A3	4301	A3	4308	A2	6302	A4						



Keyboard Control Panel



*	LC06	Jaguar
3010	390R	390R
3011	560R	560R
3012	1K8	1K8
3013	150R	150R
3014	820R	820R
6011	YES	NO
6012	YES	NO
6013	NO	YES

1001 C1
1002 C1
1003 C1
1004 C2
1005 C2
1011 C1
1012 C1
1013 C2
1014 C2
1015 C2
1016 C3
1M01 A4
2001 B3
3010 B1
3011 B2
3012 B2
3013 B1
3014 B2
3015 B1
3016 B2
3017 B2
3099 D1
4001 B4
5001 B4
6011 B3
6012 C3
6013 B3
6014 C1
6015 C1
6016 C1
6017 C2
6018 C2
F001 B4
F002 B3
F310 D1
F311 D1
I110 B3
I111 B1
I112 B1
I113 B2
I114 B2
I115 B2
I116 C1
I117 C2
I118 C2

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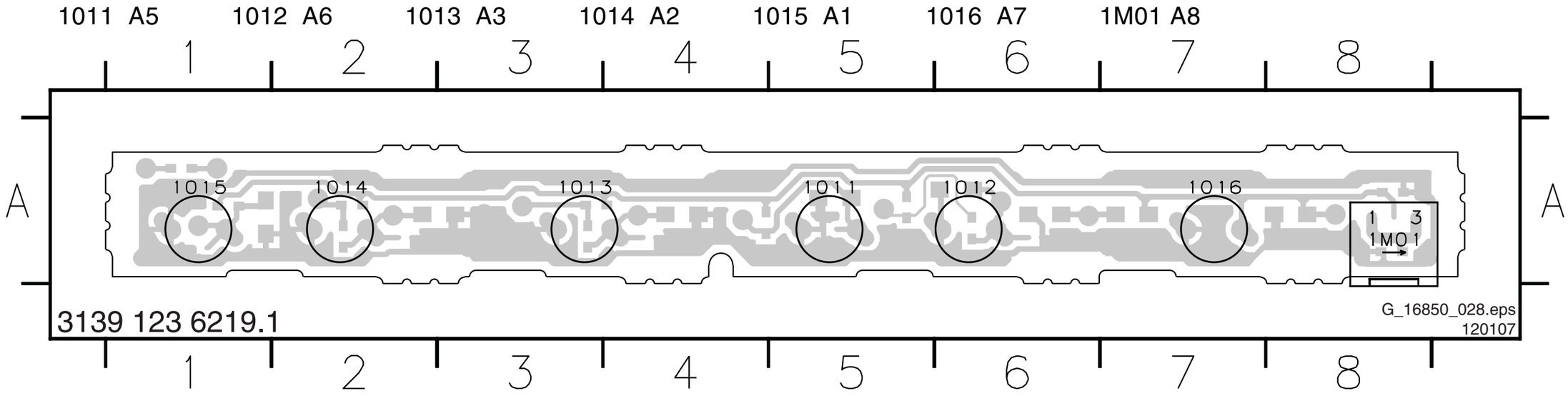
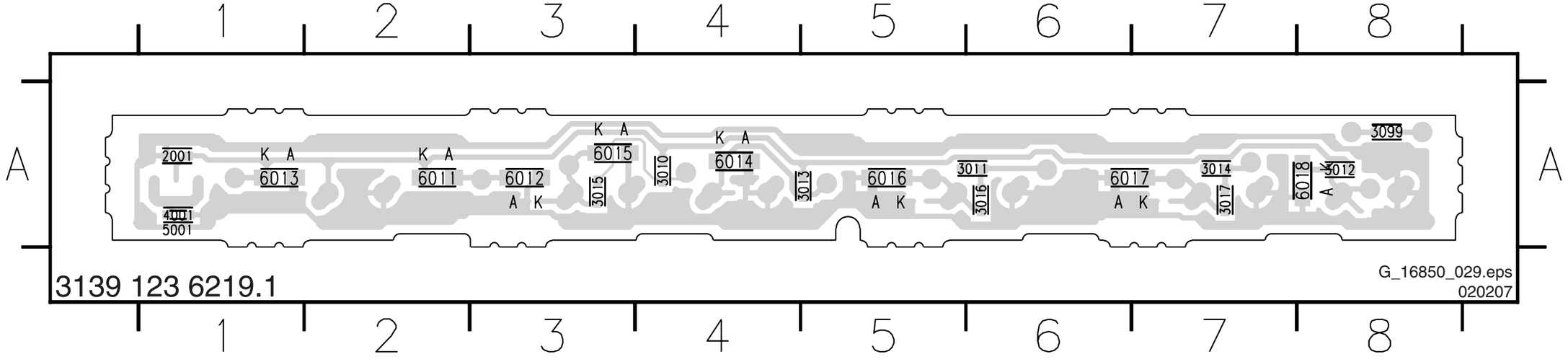
Layout Keyboard Control Panel (Top Side)

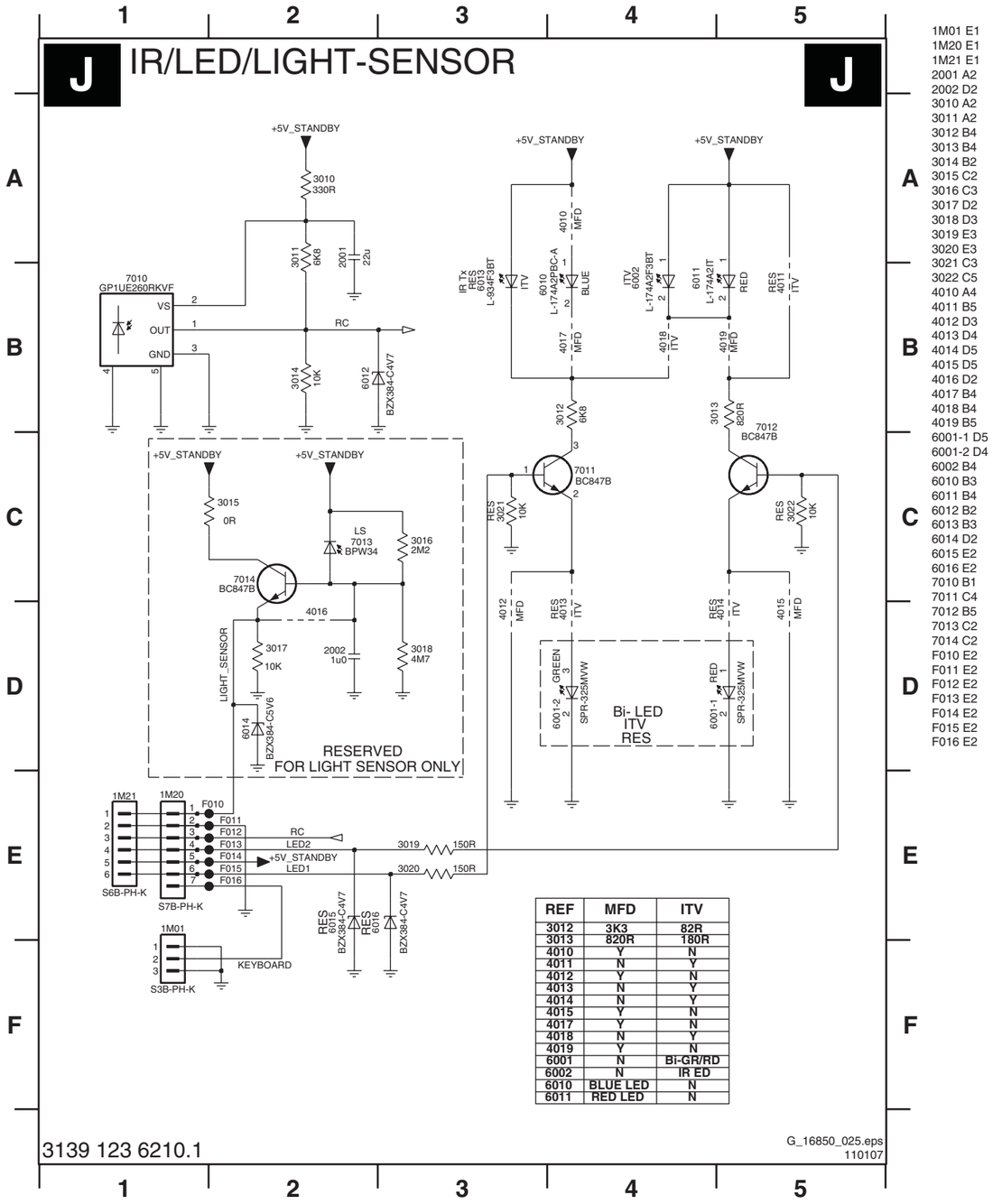


Layout Keyboard Control Panel (Bottom Side)

2001 A1 3011 A6 3013 A5 3015 A3 3017 A7 4001 A1 6011 A2 6013 A1 6015 A3 6017 A6
3010 A4 3012 A8 3014 A7 3016 A6 3099 A8 5001 A1 6012 A3 6014 A4 6016 A5 6018 A8



Front IR / LED Panel



REF	MFD	ITV
3012	3K3	82R
3013	820R	180R
4010	Y	N
4011	N	Y
4012	Y	N
4013	N	Y
4014	N	Y
4015	Y	N
4017	Y	N
4018	N	Y
4019	Y	N
6001	N	Bi-GR/RD
6002	N	IR ED
6010	BLUE LED	N
6011	RED LED	N

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1M01 E1
1M20 E1
1M21 E1
2001 A2
2002 D2
3010 A2
3011 A2
3012 B4
3013 B4
3014 B2
3015 C2
3016 C3
3017 D2
3018 D3
3019 E3
3020 E3
3021 C3
3022 C5
4010 A4
4011 B5
4012 D3
4013 D4
4014 D5
4015 D5
4016 D2
4017 B4
4018 B4
4019 B5
6001-1 D5
6001-2 D4
6002 B4
6010 B3
6011 B4
6012 B2
6013 B3
6014 D2
6015 E2
6016 E2
7010 B1
7011 C4
7012 B5
7013 C2
7014 C2
F010 E2
F011 E2
F012 E2
F013 E2
F014 E2
F015 E2
F016 E2

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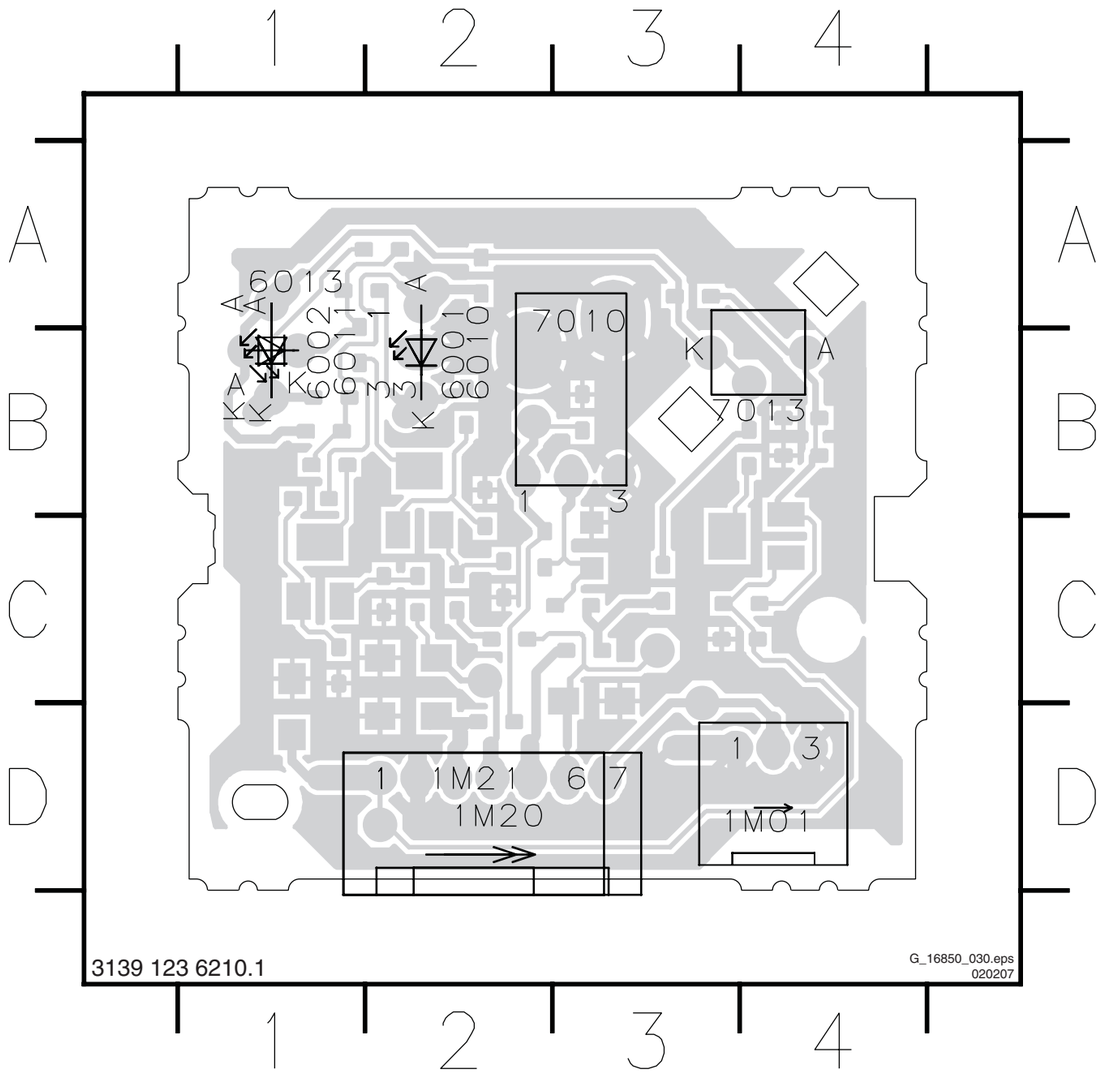
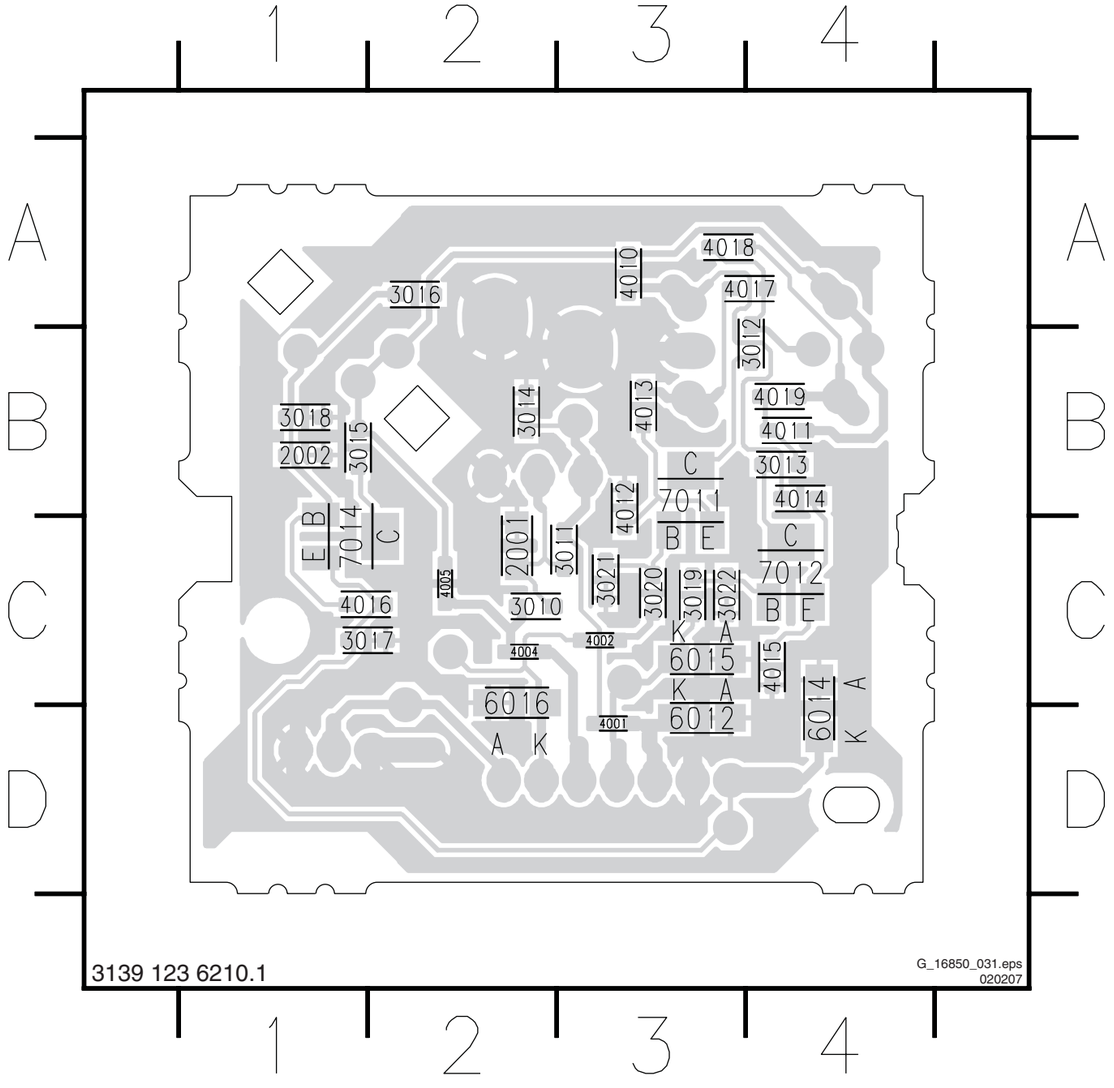
Layout Front IR / LED Panel (Top Side)

1M01	D4	6001	B2	6011	B1	7013	B4
1M20	D2	6002	B1	6013	A1		
1M21	D2	6010	B2	7010	A3		



Layout Front IR / LED Panel (Bottom Side)

2001	C2	3014	B2	3020	C3	4005	C2	4015	C4	6014	D4
2002	B1	3015	B1	3021	C3	4010	A3	4016	C1	6015	C3
3010	C2	3016	A2	3022	C3	4011	B4	4017	A4	6016	C2
3011	C3	3017	C1	4001	D3	4012	B3	4018	A3	7011	B3
3012	B4	3018	B1	4002	C3	4013	B3	4019	B4	7012	C4
3013	B4	3019	C3	4004	C2	4014	B4	6012	D3	7014	C1



Personal Notes:

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8. Alignments

Index of this chapter:

8.1 General Alignment Conditions
8.2 Hardware Alignments
8.3 Software Alignments
8.4 Option Settings

Note: Figures below can deviate slightly from the actual situation, due to the different set executions.

General: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the CURSOR UP, DOWN, LEFT or RIGHT keys of the remote control transmitter.

8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage (depends on region):
  - AP-NTSC: 120 V_{AC} or 230 V_{AC} / 50 Hz (± 10%).
  - AP-PAL-multi: 120 - 230 V_{AC} / 50 Hz (± 10%).
  - EU: 230 V_{AC} / 50 Hz (± 10%).
  - LATAM-NTSC: 120 - 230 V_{AC} / 50 Hz (± 10%).
  - US: 120 V_{AC} / 60 Hz (± 10%).
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 15 minutes.
- Measure voltages and waveforms in relation to correct ground (e.g. measure audio signals in relation to AUDIO_GND).
  Caution: It is not allowed to use heatsinks as ground.
- Test probe: Ri > 10 Mohm, Ci < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

8.2 Hardware Alignments

There are no hardware alignments foreseen for this chassis, but below find an overview of the most important DC voltages on the SSB. These can be used for checking proper functioning of the DC/DC converters.

		Specifications (V)			
Description	**Test Point**	**Min.**	**Typ.**	**Max.**	**Diagram**
+AUDIO_POWER	FB21	11.40	12.00	12.60	B02_DC-DC
-AUDIO_POWER	FB23	-11.40	-12.00	-12.60	B02_DC-DC
+12V_DISP	FB34	11.40	12.00	12.60	B02_DC-DC
+8V	F401	7.60	8.00	8.40	B04C_Audio Proc.
+5V_STANDBY	FB27	4.94	5.20	5.46	B02_DC-DC
+5V_SW	FB16	4.93	5.19	5.45	B02_DC-DC
+5V_D	I411	4.75	5.00	5.25	B04C_Audio Proc.
+5V_AUD	I410	4.75	5.00	5.25	B04C_Audio Proc.
+5V_TUN	I115	4.75	5.00	5.25	B03_Tuner IF
+3V3_STBY	FB13	3.10	3.30	3.50	B02_DC-DC
+3V3_SW	FB17	3.1	3.3	3.5	B02_DC-DC
+3V3_MOJO	FB19	3.1	3.3	3.5	B02_DC-DC
+3V3	FJ01	3.2	3.27	3.4	B03F_DVB-MOJO
+3V3FE	FF14	3.2	3.27	3.4	B03B_DVB-Demod
+1V8S_SW	FB11	1.70	1.80	1.90	B02_DC-DC
+1V2_MOJO	FB20	1.18	1.25	1.31	B02_DC-DC
+1V2_CORE	FG39	1.14	1.24	1.34	B03D_DVB-MOJO
VDISP	F210	11.40	12.00	12.60	B04B_Video proc.

8.3 Software Alignments

With the software alignments of the Service Alignment Mode (SAM) the Tuner and RGB settings can be aligned.
To store the data: Use the RC button “Menu” to switch to the main menu and next, switch to “Stand-by” mode.

8.3.1 Tuner Adjustment (RF AGC Take Over Point)

Purpose: To keep the tuner output signal constant as the input signal amplitude varies.

The LC7.xx chassis comes with two tuner types: the UV1318S for the analogue sets (LC7.1x) and the TD1316AF for the hybrid sets (LC7.2x).

For the digital tuner TD1316AF, no alignment is necessary, as the AGC alignment is done automatically (standard value: “15”), even during analogue reception.

The analogue tuner UV1318S can also use the default value of “15”, however in case of problems use the following method (use multimeter and RF generator):

- Apply a vision IF carrier of 38.9 MHz (105 dBuV = 178 mVrms) to test point F111 (input via 50 ohm coaxial cable terminated with an RC network of series 10nF with 120 ohm to ground).
- Measure voltage on pin 1 of the tuner.
- Adjust AGC (via SAM menu: TUNER -> AGC), until voltage on pin 1 is 3.3 +0.5/-1.0 V.
- Store settings and quit SAM.

8.3.2 RGB Alignment

Before alignment, choose “TV MENU” -> “Picture” and set:

- “Brightness” to “50”.
- “Colour” to “50”.
- “Contrast” to “100”.

White Tone Alignment:

- Activate SAM.
- Select “RGB Align.” -> “White Tone” and choose a colour temperature.
- Use a 100% white screen as input signal and set the following values:
  - All “White point” values initial to “256”.
  - All “BlackL Offset” values to “0”.

In case you have a colour analyser:

- Measure with a calibrated (phosphor- independent) colour analyser (e.g. Minolta CA-210) in the centre of the screen. Consequently, the measurement needs to be done in a dark environment.
- Adjust the correct x,y coordinates (while holding one of the White point registers R, G or B on “256”) by means of decreasing the value of one or two other white points to the correct x,y coordinates (see table “White D alignment values”). Tolerance: dx: ± 0.004, dy: ± 0.004.
- Repeat this step for the other colour Temperatures that need to be aligned.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Table 8-1 White D alignment values

Value	Cool (11000 K)	Normal (9000 K)	Warm (6500 K)
x	0.278	0.289	0.314
y	0.278	0.291	0.319

If you do **not** have a colour analyser, you can use the default values. This is the next best solution. The default values are average values coming from production (statistics).

- Set the RED, GREEN and BLUE default values per temperature according to the values in the “Tint settings” table.

- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Table 8-2 Tint settings

Colour Temp.	R	G	B
Cool	249	241	246
Normal	251	238	229
Warm	246	222	199

Black Level Offset Alignment
- Activate SAM.
- Select “RGB Align.” -> “BlackL Offset” and choose a colour.
- Set all “BlackL Offset” values to “0”.
- When finished return to the SAM root menu and press STANDBY on the RC to store the aligned values to the NVM.

Note: For models with “Pixel Plus”, the “Black Offset” (black level offset) should NOT be changed in SAM. These offset values of RGB should be set to “0”, and should **NOT** be adjusted. Any adjustment of these values will affect the low light white balance.

ADC YPbPr Gray Scale Alignment
When the grey scale is not correct, use this alignment:
- Activate SAM.
- Select “NVM Editor”.
- Enter address “ 26(dec)” (ADR).
- Set value (VAL) to “197(dec) ± 25”.
- Store (STORE) the value.

8.4 Option Settings

8.4.1 Introduction

The microprocessor communicates with a large number of I²C ICs in the set. To ensure good communication and to make digital diagnosis possible, the microprocessor has to know which ICs to address. The presence/absence of these specific ICs (or functions) is made known by the option codes.

Notes:
- After changing the option(s), save them with the STORE command.
- The new option setting becomes active after the TV is switched "off" and "on" again with the mains switch (the EAROM is then read again).

8.4.2 How To Set Option Codes

When the NVM is replaced, all options will require resetting. To be certain that the factory settings are reproduced exactly, you must set all option numbers. You can find the correct option numbers in table “Option Codes OP1...OP7“ below.

How to Change Options Codes
An option code (or “option byte”) represents eight different options (bits). When you change these numbers directly, you can set all options very quickly. All options are controlled via seven option numbers (OP1... OP7).
Activate SAM and select “Options”. Now you can select the option byte (OP1.. OP7) with the CURSOR UP/ DOWN keys, and enter the new 3 digit (decimal) value. For the correct factory default settings, see the table “Option codes OP1...OP7“ below. For more detailed information, see the second table “Option codes at bit level“. If an option is set (value “1”), it represents a certain decimal value.
When all the correct options (bits) are set, the sum of the decimal values of each Option Byte (OP) will give the option code.

Sets 12NC	Sets Type	Panel Type	Panel Code (Dec)	Option Byte						
LC07_EU_ATV_LCD_Europe (/10)				Group 1				Group 2		
				1	2	3	4	5	6	7
867000025487	26PFL5322/10	LPL : LC260WX2-SLB2	045	003	023	010	223	009	000	000
		CMO : V260B1-L03	068							
		AUO : T260XW03 V1	067							
867000025408	32PFL5322/10	LPL : LC320W01-SL06	046							001
		AUO : T315XW02 VD	091							
		CMO : V315B1-L05	069							
867000025489	37PFL5322/10	LPL : LC370WX1-SLB1	071							002
		AUO : T370XW02 V5	072							
867000025492	42PFL5322/10	LPL : LC420WX3-SLA1	073							
		AUO : T420XW01 V8	076							
		LPL : LC420WX5-SLD1	107							
LC07_EU_ATV_LCD_Pan Europe (/12)										
867000025488	26PFL5322/12	LPL : LC260WX2-SLB2	045	003	023	010	223	009	000	000
		CMO : V260B1-L03	068							
		AUO : T260XW03 V1	067							
867000025439	32PFL5322/12	LPL : LC320W01-SL06	046							001
		AUO : T315XW02 VD	091							
		CMO : V315B1-L05	069							
867000025491	37PFL5322/12	LPL : LC370WX1-SLB1	071							002
		AUO : T370XW02 V5	072							
867000025493	42PFL5322/12	LPL : LC420WX3-SLA1	073							
		AUO : T420XW01 V8	076							
		LPL : LC420WX5-SLD1	107							
LC07_EU_ATV_PDP_Europe (/10)										
867000025494	42PFP5332/10	SDI : 42 HD W2	083	003	007	011	223	009	000	003
		LG : 42 HD X4	084							
LC07_EU_ATV_PDP_Pan Europe (/12)										
867000025495	42PFP5332/12	SDI : 42 HD W2	083	003	007	011	223	009	000	003
		LG : 42 HD X4	084							

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Figure 8-1 Option codes OP1...OP7 (for all LC7.1E models)

Option Bit Overview

Below find an overview of the Option Codes on **bit** level.

Table 8-3 Option codes at bit level (OP1-OP4)

Option Byte & Bit	Dec. Value	Option Name	Description
Byte OP1			
Bit 7 (MSB)	128	Reserved	Not Used (Reserved)
Bit 6	64	CHINA	ON = SW is for CHINA only OFF = SW is for Non-China AP cluster
Bit 5	32	DTV_CHINA	ON = DTV_CHINA will be available (Reserved) OFF = DTV_CHINA will not be available
Bit 4	16	DTV_EU	ON = DTV will be available OFF = DTV will not be available
Bit 3	8	UK_PNP	ON = UK PNP is available OFF = UK PNP is not available
Bit 2	4	VIRGIN_MODE	ON = Virgin Mode (PNP) is available OFF = Virgin Mode (PNP) is not available
Bit 1	2	ACI	ON = ACI is available OFF = ACI is not available
Bit 0 (LSB)	1	ATS	ON = ATS is available OFF = ATS is not available
Total DEC Value			
Byte OP2			
Bit 7 (MSB)	128	1080P	ON = 1080p is available OFF = 1080p is not available
Bit 6	64	LIGHT_SENSOR	ON = Light Sensor is available OFF = Light Sensor is not available
Bit 5	32	AMBILIGHT	ON = Ambilight Feature will be available OFF = Ambilight Feature will not be available
Bit 4	16	BACKLIGHT_DIMMING	ON = Backlight Dimming is available OFF = Backlight Dimming is not available
Bit 3	8	HUE	ON = Hue is available OFF = Hue is not available
Bit 2	4	2D3DCF	ON = 3D Comb Filter is available OFF = 2D Comb Filter is available
Bit 1	2	WSSB	ON = WSS is available OFF = WSS is not available
Bit 0 (LSB)	1	WIDE_SCREEN	ON = TV is 16x9 set OFF = TV is 4x3 set
Total DEC Value			
Byte OP3			
Bit 7 (MSB)	128	CVI2	ON=CVI1 (YPbPr) (For ROW)
Bit 6	64	Reserved	Not Used (Reserved)
Bit 5	32	Reserved	Not Used (Reserved)
Bit 4	16	VCHIP	ON = VChip is available OFF = VChip is not available
Bit 3	8	VIDEO_TEXT	ON = Video-TXT is available OFF = Video-TXT is not available
Bit 2	4	STEREO_DBX	ON = Stereo DBX detection is available (LATAM) OFF = Stereo DBX detection is not available
Bit 1	2	STEREO_NICAM_2CS	ON = Stereo NICAM 2CS detection is available (EU/AP/China) OFF = Stereo NICAM 2CS detection is not available
Bit 0 (LSB)	1	LIP_SYNC	ON = Lip Sync is available OFF = Lip Sync is not available
Total DEC Value			
Byte OP4			
Bit 7 (MSB)	128	HDMI2	ON = HDMI2 is available OFF = HDMI2 is not available
Bit 6	64	HDMI1	ON = HDMI1 is available OFF = HDMI1 is not available
Bit 5	32	VGA	ON = VGA is available OFF = VGA is not available
Bit 4	16	SVHS3	ON = SVHS3 is available OFF = SVHS3 is not available
Bit 3	8	AV3	ON = AV3 is available OFF = AV3 is not available
Bit 2	4	CVI	ON = CVI is available OFF = CVI is not available
Bit 1	2	SVHS2	ON = SVHS2 is available OFF = SVHS2 is not available
Bit 0 (LSB)	1	AV2	ON = AV2 is available OFF = AV2 is not available
Total DEC Value			

Table 8-4 Option codes at bit level (OP5-OP7)

Option Byte & Bit	Dec. Value	Option Name	Description
Byte OP5			
Bit 7 (MSB)	128	NVM_CHECK	ON = NVM (range) checking is available OFF = NVM (range) checking is not available
Bit 6	64	Reserved	Not Used (Reserved)
Bit 5	32	Reserved	Not Used (Reserved)
Bit 4	16	MP_ALIGN	ON = Using multi-point alignment for Gamma & White Point OFF = Using old way for Gamma (pre-defined) & WP alignment
Bit 3	8	SYS_RECVRY	ON = System Recovery is available OFF = System Recovery is not available
Bit 2	4	SL_WIRED	ON = BDS Smart Loader Wired is available OFF = BDS Smart Loader Wired is not available
Bit 1	2	HOTEL	ON = Hotel/BDS is available OFF = Hotel/BDS is not available
Bit 0 (LSB)	1	SS_DEMO	ON = Split Screen Demo is available OFF = Split Screen is not available
Total DEC Value			
Byte OP6			
Bit 7 (MSB)	128	Reserved	Not Used (Reserved)
Bit 6	64	Reserved	Not Used (Reserved)
Bit 5	32	Reserved	Not Used (Reserved)
Bit 4	16	Reserved	Not Used (Reserved)
Bit 3	8	TUNER PROFILE	0 = ATV_EU_PHILIPS UV1318S/AIH-3 1 = ATV_EU_Panasonic EN57K28G3F2 = DTV_EU_PHILIPS TD1316AF/IHP-24 = ATV_AP_PHILIPS UV1316E/AIH-45 = ATV_AP_Tuner2 (Reserved)6 = ATV_CHINA_ALPS TEDE9-286B7 = ATV_CHINA_Tuner2 (Reserved)8 = ATV_LATAM_PHILIPS UV1338/AIH-4 9 = ATV_LATAM_Tuner2 (Reserved)10 = DTV_CHINA_Tuner1 (Reserved)11 = DTV_CHINA_Tuner2 (Reserved)12 = Not Used (Reserved)13 = Not Used (Reserved)14 = Not Used (Reserved)15 = Not Used (Reserved)
Bit 2	4		
Bit 1	2		
Bit 0 (LSB)	1		
Total DEC Value			
Byte OP7			
Bit 7 (MSB)	128	Reserved	Not Used (Reserved)
Bit 6	64	Reserved	Not Used (Reserved)
Bit 5	32	Reserved	Not Used (Reserved)
Bit 4	16	CABINET PROFILE	0 = Cabinet_Profile_26_LCD_ME7 1 = Cabinet_Profile_32_LCD_ME7 2 = Cabinet_Profile_37_42_47_LCD_ME73 = Cabinet_Profile_42_50_PDP_ME7 4 = Cabinet_Profile_26_LCD_ME5P5 - 32 = Reserved
Bit 3	8		
Bit 2	4		
Bit 1	2		
Bit 0 (LSB)	1		
Total DEC Value			

9. Circuit Descriptions, Abbreviation List, and IC Data Sheets

Index of this chapter:

9.1 Introduction
9.2 LCD Power Supply
9.3 DC/DC converters
9.4 Front-End
9.5 Video Processing
9.6 Memory addressing
9.7 Audio Processing
9.8 HDMI
9.9 Abbreviation List
9.10 IC Data Sheets

Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the Wiring, Block (chapter 6) and Circuit Diagrams (chapter 7). Where necessary, you will find a separate drawing for clarification.

9.1 Introduction

The LC7.x (development name “LC07”) is a new global chassis for the year 2007 (LC7.1 is the analogue range, LC7.2 is the digital range). It covers a screen size of 26 to 47 inch for LCD and 42 to 50 inch for Plasma sets with a new styling called “ME7”. Some key components are:

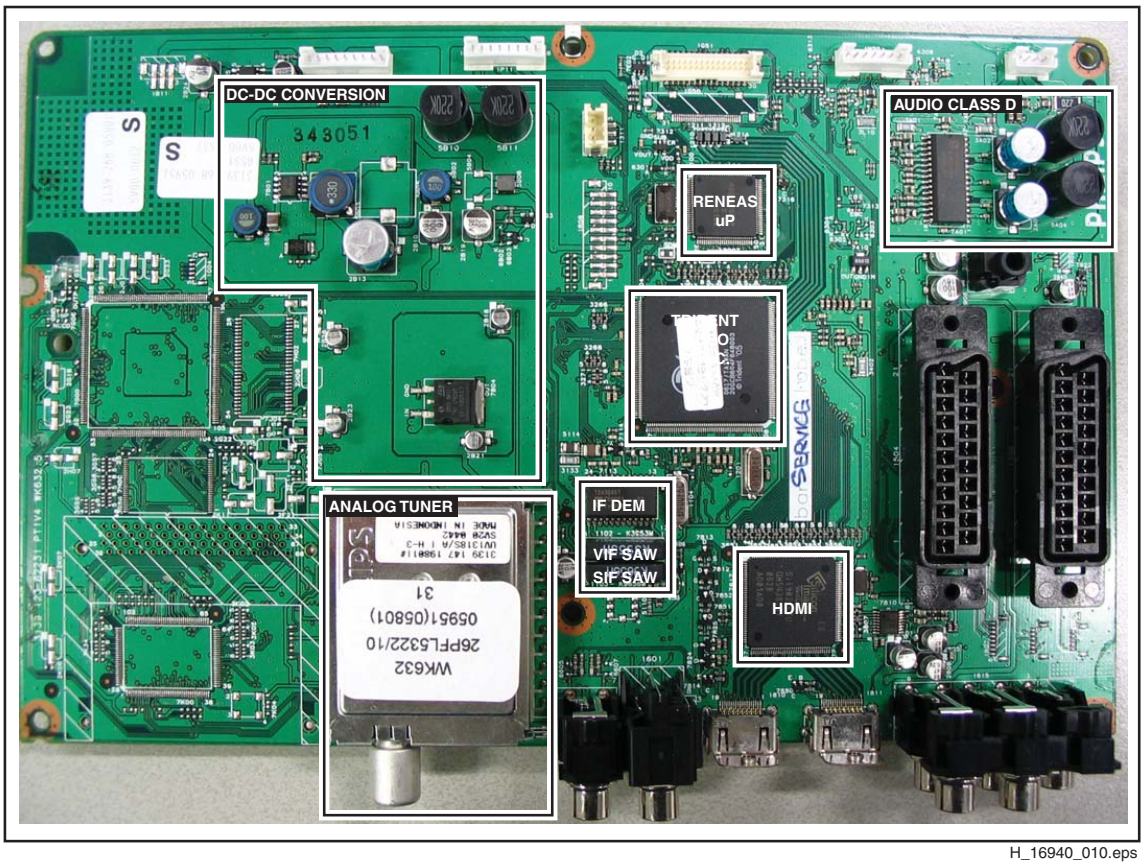
- **Audio**: Sound processing is performed by a multi-standard sound processor MSP4450 (item 7411)
- **Video**: Video processing is performed by the Trident video processor SVP CV32-LF (item 7202).

For analogue reception, a standard IF demodulator is used, whereas digital input signals (DVB-T) are processed through a COFDM channel decoder together with an MPEG decoder. A so-called “Reneas” microprocessor performs the control functionality.

Important features of this chassis are:

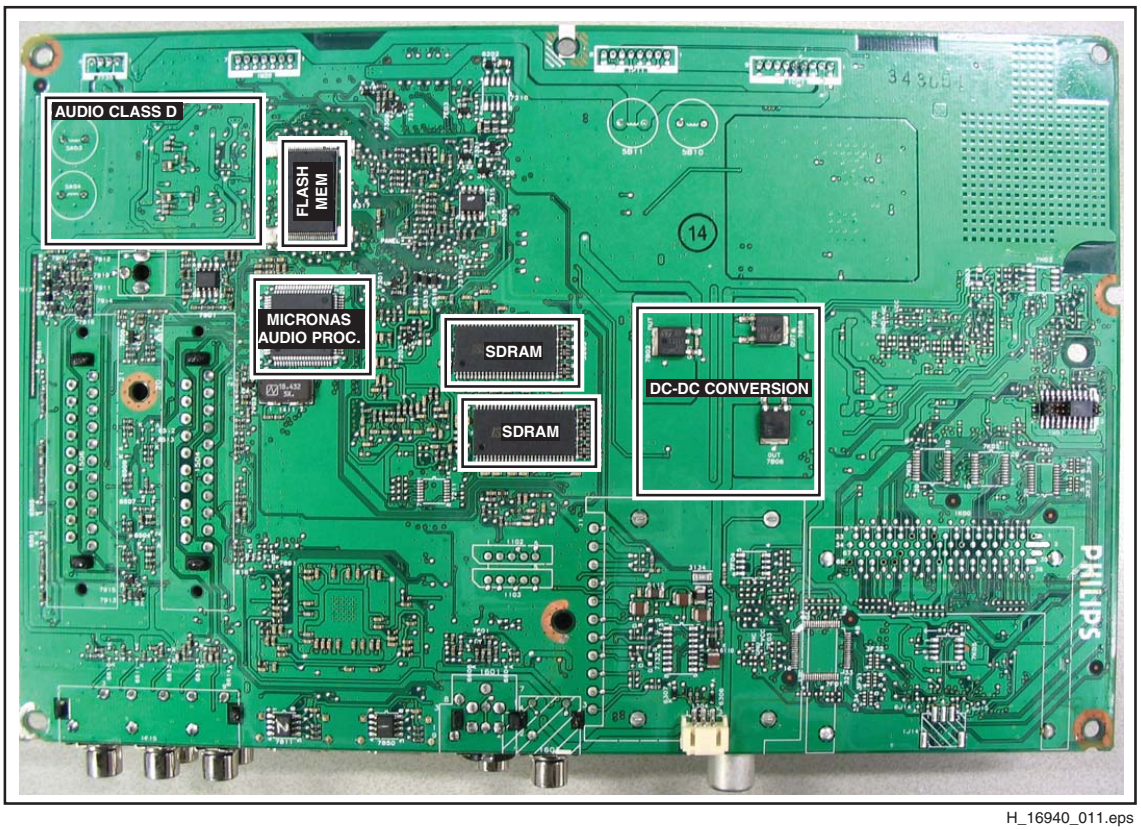
- **AmbiLight:** LED AmbiLight (where applicable) is introduced as the successor of glass-tube AmbiLight
- **1080p Full HD** (where applicable).

9.1.1 SSB Cell Layout



H_16940_010.eps
060307

Figure 9-1 SSB top view



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060307

Figure 9-2 SSB bottom view

9.2 LCD Power Supply

The Power Supply Unit (PSU) in this chassis is a buy-in and is a black-box for Service. When defective, a new panel must be ordered and the defective panel must be sent for repair, unless the main fuse of the unit is broken. Always replace the fuse with one with the correct specifications! This part is available in the regular market.

Three different PSU can be used in this chassis:
- 26 and 32 inch sets use a “Delta” PSU
- 37 and 42 inch sets use a “PPS” (Philips Power Solutions) PSU
- 47 inch sets use a “Delta” PSU.

Figure “Overview of PSU connectivity” shows the connectivity of the Power Supply Unit with the other panels in the set.

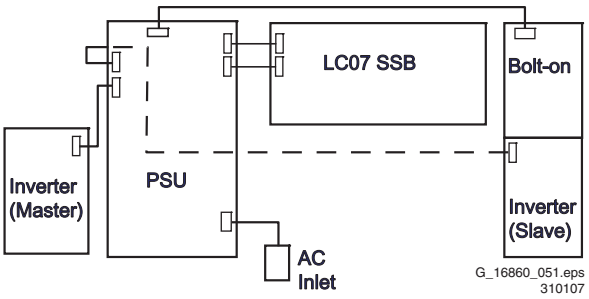


Figure 9-3 Overview of PSU connectivity

All Power Supply Units deliver the following voltages to the chassis:
- +24 V to the inverters
- +12 V to SSB
- +12 V and -12 V to Audio Supply
- 12 V to Bolt-on Supply (where applicable)
- +5.2 V Standby voltage.

9.3 DC/DC converters

A switch generates the +5.2 V (+5V_SW) from the +5.2 V (+5V_STANDBY) supply voltage. For LCD sets, this switch is mounted on-board the SSB. For PDP sets, this switch is mounted on the Power Supply Panel. This results in the +5V_STANDBY (and +5V_SW for PDP sets) voltage(s), coming from the Power Supply Unit, is (are) used as input for the on-board DC/DC converters.
They deliver the following voltages to the board:
- +3.3 V (+3V3_STBY)
- +5.2 V (+5V_SW) (only for LCD sets)
- +1.8 V (+1V8S_SW)
- +34 V (+VTUN)
- +3.3 V (+3V3_SW)
- +3.3 V (+3V3_MOJO)
- +1.2 V (+1V2_MOJO)

An overview can be found in figure “DC-DC converter block diagram”.

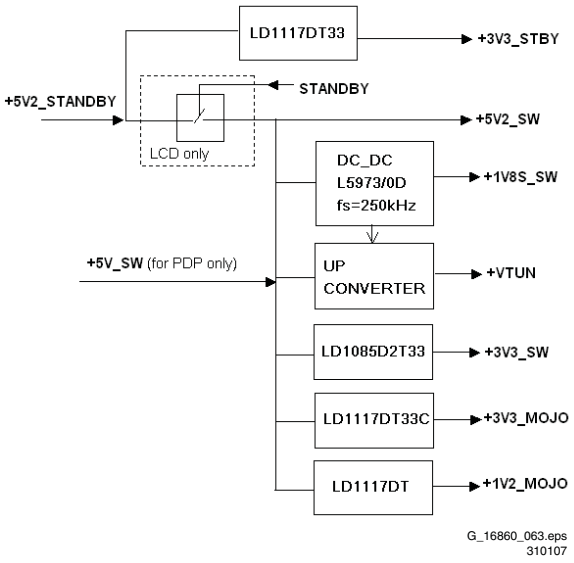


Figure 9-4 DC-DC converter block diagram

9.4 Front-End

This chassis uses different tuners depending on the region and execution. An overview of the different executions can be found in table “Tuner diversity”.

Table 9-1 Tuner diversity

Region	Tuner	Type
Europe	TD1316AF	hybrid
	UV1318S	analogue
AP	UV1316E	analogue
China	TEDE9	analogue
Latam	UV1338	analogue

For a general outline of tuner applications in this chassis see figure “Tuner IF diagram”.

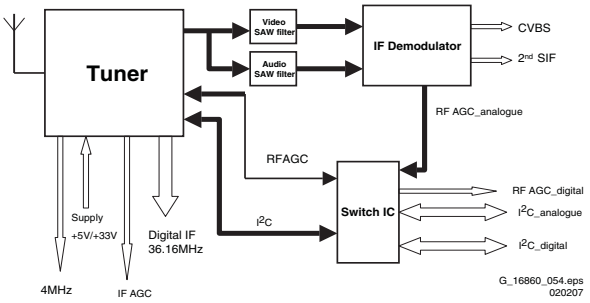


Figure 9-5 Tuner IF diagram

In the LC7.1x chassis (analogue sets), the signal coming from the tuner is fed to the IF demodulator (through the SAW filters) and then passed to the Trident Video Processor.

In the LC7.2x chassis (digital sets), the TD1316AF hybrid tuner is used which is capable of receiving both analogue and digital (DVB-T) signals. While receiving analogue signals, the signal coming from the tuner is fed to the IF demodulator (through the SAW filters) and then passed to the Trident Video Processor. While receiving digital signals, the signal coming from the tuner is first fed to the channel decoder, then to the MPEG decoder and then to the Trident Video Processor.

9.4.1 Video IF Amplifier

The IF-filter is integrated in a SAW (Surface Acoustic Wave) filter. One for filtering IF-video (item 1102) and one for IF-audio (item 1103). The type of these filters depends on the standard(s) received (region-dependency). Some filters can be switched to another standard, what makes them suitable for applications in multi-standard platforms. An overview of the SAW filter diversity can be found in table “SAW filter diversity”.

Table 9-2 SAW filter diversity

SAW filter	Switching Y/N	Region	Video/Audio
OFWK3953M	No	Europe	Video
OFWK9656M	Yes	Europe	Audio
OFWK7265L	Yes	AP	Video
OFWK9361L	No	AP	Sound
OFWK3956L	No	China	Video
OFWK3955L	No	China	Video
OFWK9352L	No	China	Audio
OFWM1967L	No	LATAM	Video/Audio

Switching is done by the microcontroller via SAW_SW. In table “SAW filter switching” is explained how to address the different system standards.

Table 9-3 SAW filter switching

Region	SAW_SW	System
Europe	1	L’
	0	other systems
AP	1	B/G, D/K, I
	0	M/N
China	1	B/G, D/K, I
	0	M/N
LATAM	n.a.	M/N

The hybrid tuner TDA1316AF, used in Europe sets, needs to be switched between digital and analogue mode. This is done by the microcontroller via DVB_SW. Refer to table “Hybrid tuner digital/analogue switching” for details.

Table 9-4 Hybrid tuner digital/analogue switching

Region	DVB_SW	Mode
Europe	1	analogue reception
	0	Digital reception

The pin assignment of all analogue tuners is equal and can be found in table “Pin assignment analogue tuners”.

Table 9-5 Pin assignment analogue tuners

Pin number	Description	DC voltage (V)
1	RF AGC voltage	3.3 - 4.5 (weak or no signal) < 3.3 (strong signal)
2	n.c.	
3	I^2C-bus address select	0
4	SCL	0 to 3.3
5	SDA	0 to 3.3
6	n.c.	
7	supply voltage	5 ±0.25
8	n.c.	
9	tuning supply voltage	33
10	n.c.	
11	TV IF output	

The pin assignment of the hybrid tuner can be found in table “Pin assignment hybrid tuner”.

Table 9-6 Pin assignment hybrid tuner

Pin number	Description	DC voltage (V)
1	n.c.	
2	RF AGC voltage	3.3 - 4.5 (weak or no signal) < 3.3 (strong signal)
3	I^2C-bus address select	0
4	SCL	0 to 3.3
5	SDA	0 to 3.3
6	4 MHz reference output	
7	supply voltage	5 ±0.25
8	broadband IF output	
9	IF AGC voltage	0 to 3
10	narrowband IF output	
11	narrowband IF output	

9.4.2 Automatic Gain Control

In the LC7.2x chassis (digital sets), the automatic gain control depends on if the set is receiving a digital or an analogue signal. During analogue reception, the hybrid tuner receives an external AGC voltage, coming from the demodulator, to perform automatic gain control. During digital reception, no external AGC voltage is used but the tuners internal AGC loop is used.

In the LC7.1x chassis (analogue sets), the tuner receives an external AGC voltage, coming from the demodulator, to perform automatic gain control.

9.5 Video Processing

The video processing is completely handled by the Trident SVP CX32 video processor which features:

- CVBS-input for analogue signals
- RGB-input for digital (DVB-T) signals
- Motion and “edge-adaptive” deinterlacing
- Integrated ADC
- Built-in 8-bit LVDS transmitter
- Colour stretch
- Skin colour enhancement
- 3D Digital Comb Video Decoder
- Interlaced and Progressive Scan refresh
- Teletext decoding
- OSD and VBI/Closed Caption.

9.5.1 Region-dependent applications

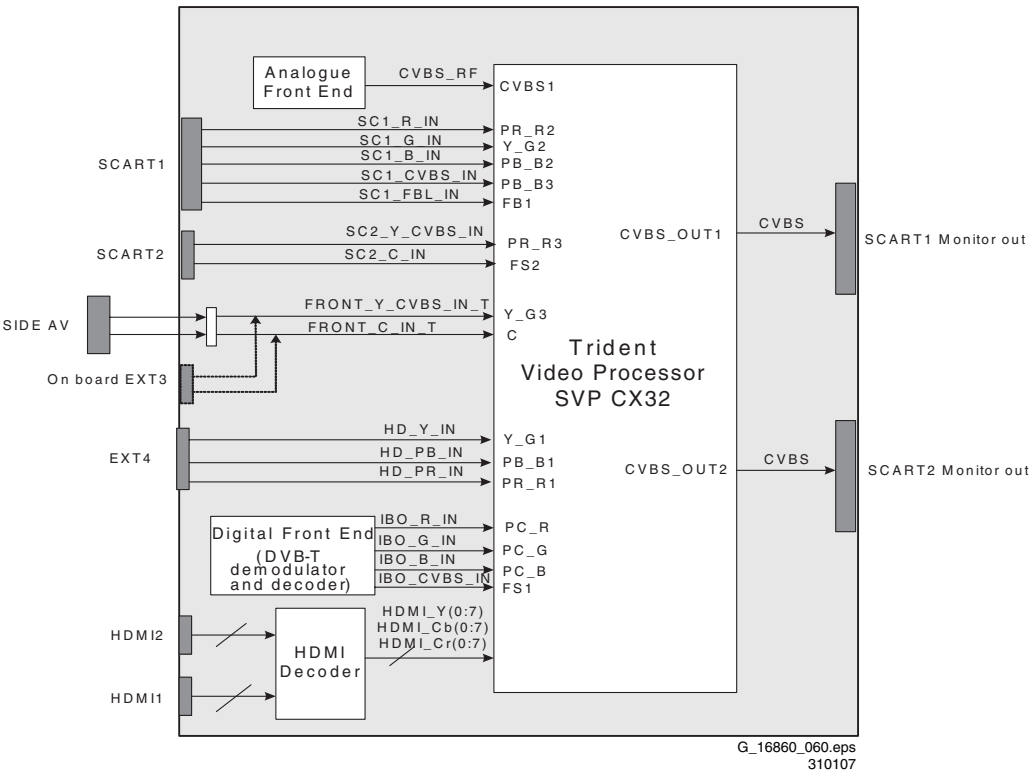


Figure 9-6 Block diagram video processing - EU version

"Block diagram video processing - EU version" shows the input and output signals to and from the Trident Video Processor in EU applications.

During analogue reception, a CVBS signal coming from the analogue front-end is fed to the video processor via pin CVBS1. During digital reception, the video signal coming from the MPEG decoder (MOJO) is fed to the video processor via pins FS1, PC_B, PC_G and PC_R.

The video processor also interfaces the SCART1 & 2 input, side AV, EXT4 (HD where applicable) and HDMI1 & 2 input. Through the SCART1 & 2 connectors, a monitor output is foreseen.

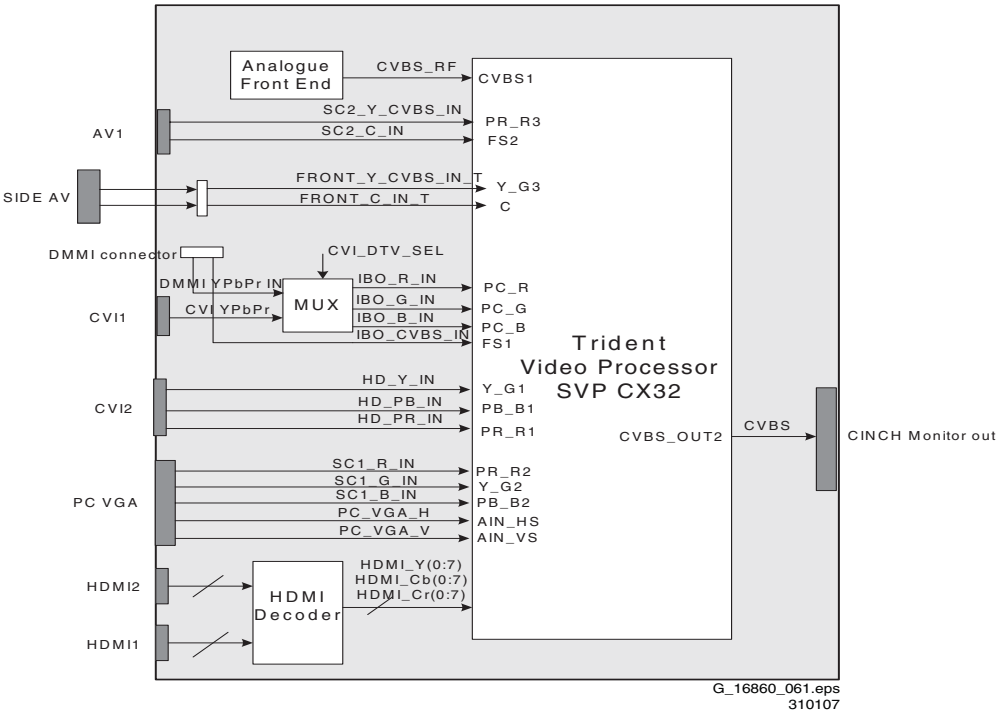


Figure 9-7 Block diagram video processing - AP version

"Block diagram video processing - AP version" shows the input and output signals to and from the Trident Video Processor in AP applications.

During analogue reception, a CVBS signal coming from the analogue front-end is fed to the video processor via pin CVBS1. No digital reception (DVB-T) reception is foreseen in AP region. However, an internal DMMI connector is implemented for future digital reception applications in combination with IBO. CVI_DTV_SEL is a control signal from the microprocessor. When this signal is LOW, then the MUX passes the CVI1 YPbPr input signal to the Trident Video Processor. When this signal is HIGH, then the YPbPr input signal coming from the DMMI connector is passed to the video processor. Currently, this signal is always LOW since no IBO is used.

The video processor also interfaces the AV1 and Side AV input, CVI2 (HD), VGA(PC), HDMI1 & 2. A cinch output connector for Monitor output is foreseen.

9.6 Memory addressing

Figure "Memory block diagram" shows the interconnection between the microprocessor, the FLASH memory, the Trident Video Processor and the SDRAM.

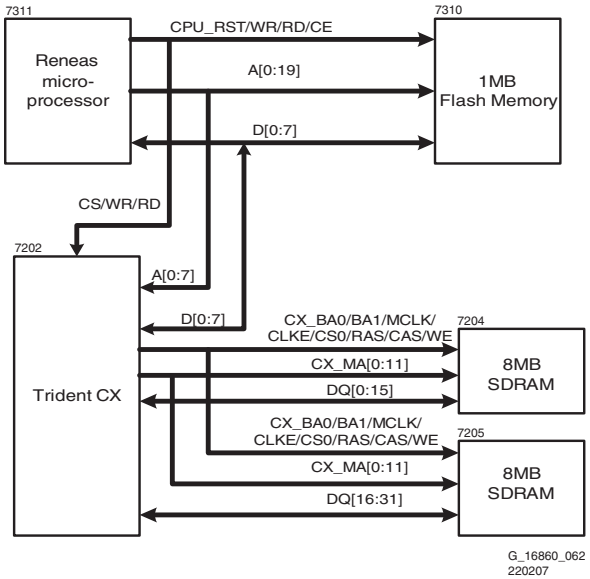


Figure 9-8 Memory block diagram

Control signals CPU_RST, WR, RD and CE, address lines A[0:19] and data lines D[0:7] are used for transferring data between the microprocessor (item 7311) and the flash memory (item 7310). Control signals CS, WR and RD, address lines A[0:7] and data lines D[0:7] are used for transferring data between the Trident Video Processor (item 7202) and the microprocessor (item 7311). Control signals CX_BA0, CX_BA1, CX_MCLK, CX_CLKE, CX_CS0, CX_RAS, CX_CAS and CX_WE, address lines CX_MA[0:11] and data lines DQ[0:15] are used for transferring data between the Trident Video Processor and the SDRAM ICs (items 7204 and 7205).

9.7 Audio Processing

The audio decoding is done entirely via the Multistandard Sound Processor (MSP) 4450P (item 7411).
This processor covers the processing of both analogue and (NICAM) digital input signals by processing the (analogue) IF signal-in to processed (analogue) AF-out (baseband audio). An internal 40 ms (stereo) audio delay line (LIP SYNC) is foreseen and therefore no external delay line is necessary.

All internal clock signals are derived from an external 18.432 MHz oscillator, which, in NICAM or I²S-mode, on its turn is locked to the corresponding source.

The following functionality is included:
- Automatic Standard Detection (ASD) automatically detects the actual broadcasted TV standard
- Automatic Sound Select (ASS) automatically switches (without any I²C-bus action) between mono/stereo/ bilingual mode when the broadcast mode changes.

9.7.1 Region-dependent applications

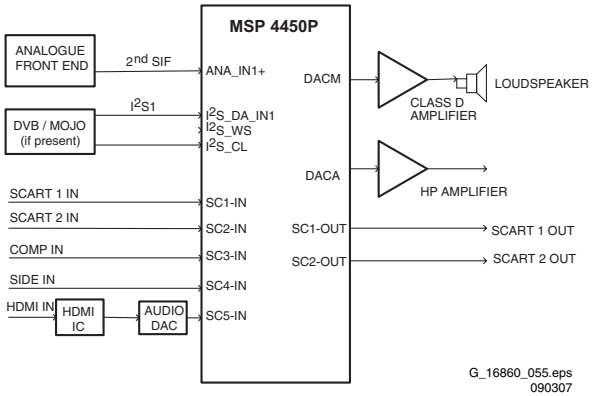


Figure 9-9 Block diagram audio processing - EU application

In EU applications, the MSP features:
- Sound IF input for signals coming from the analogue front-end
- Three I²S-inputs for signals ("DATA", "CLK" and "WS") coming from the MOJO in case of digital reception
- Five analogue inputs: for EXT1 to EXT4 and HDMI
- Loudspeaker output path
- Headphone output path
- SCART-1 output path (RF)
- SCART-2 output path (WYSIWYG = monitor).

Digital audio signals coming from HDMI sources are fed to a digital-to-analogue converter and then fed to the MSP.
In case of reception of digital TV signals, digital audio signals coming from the MOJO are directly fed to the MSP via the I2S_DA_IN1, I2S_WS1 and I2S_CL1 lines. This ensures a "true digital path".

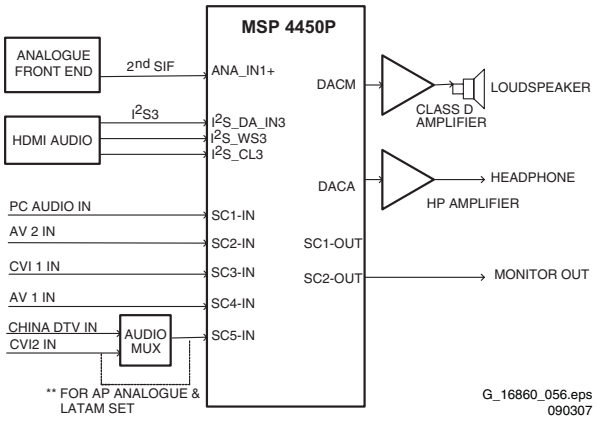


Figure 9-10 Block diagram audio processing - AP application

In AP applications, the MSP features:
- Sound IF input for signals coming from the analogue front-end

- Three I²S-inputs for signals (“DATA”, “CLK” and “WS”) coming from the HDMI interface
- Five analogue inputs: for CVI1, CVI2, AV1, AV2, DTV (China) and PC audio
- Loudspeaker output path
- Headphone output path
- Monitor output path (WYSIWYG).

Digital audio signals coming from HDMI sources are directly fed to the MSP via the I2S_DA_IN3, I2S_WS3 and I2S_CL3 lines. This ensures a “true digital path”.
In case of reception of digital TV signals, a multiplexer is used to switch between China DTV or DVI2 audio. In China sets, the audio signal coming from the DTV module is in analogue format. The output from the multiplexer is fed to the MSP via the SC5-input.

In both applications, the microprocessor (item 7311) controls the audio part with the following control lines:
- MUTEn: used to mute the Class D amplifiers
- ANTI_PLOP: used to detect any DC failure in the Class D amplifiers
- DC_PROT: used to detect any DC failure in the Class D amplifiers.

9.7.2 Audio Amplifier

The audio amplifier is an integrated class-D amplifier (TDA8932T, item 7A01). It combines a good performance with a high efficiency, resulting in a big reduction in heat generation.

Principle

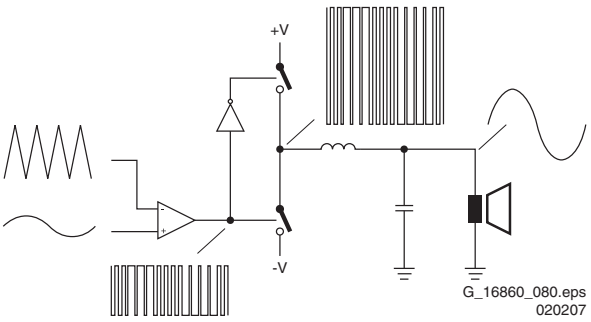


Figure 9-11 Principle Class-D Amplifier

The Class D amplifier works by varying the duty cycle of a Pulse Width Modulated (PWM) signal.
By comparing the input voltage to a triangle wave, the amplifier increases duty cycle to increase output voltage, and decreases duty cycle to decrease output voltage.
The output transistors of a Class D amplifier switch from 'full off' to 'full on' (saturated) and then back again, spending very little time in the linear region in between. Therefore, very little power is lost to heat. If the transistors have a low 'on' resistance (RDS(ON)), little voltage is dropped across them, further reducing losses.
A Low Pass Filter at the output passes only the average of the output wave, which is an amplified version of the input signal. In order to keep the distortion low, negative feedback is applied.

The **advantage** of Class D is increased efficiency (= less heat dissipation). Class D amplifiers can drive the same output power as a Class AB amplifier using less supply current.
The **disadvantag**e is the large output filter. The main reason for this filter is that the switching waveform results in maximum current flow. This causes more loss in the load, which causes lower efficiency. An LC filter with a cut-off frequency less than the Class D switching frequency, allows the switching current to flow through the filter instead of the load, thus reducing the overall loss and increasing the efficiency.

DC-protection
A DC-detection circuit is foreseen to protect the speakers. It is built around three transistors (items 7A05 to 7A07) and generates a protection signal (DC_PROT) to the microprocessor in case of a DC failure in the Class D amplifiers.

9.8 HDMI

9.8.1 Introduction

Note: Text below is an excerpt from the ”HDMI Specification” that is issued by the HDMI founders (see *http://www.hdmi.org*).

The High-Definition Multimedia Interface is developed for transmitting digital signals from DVD players, set-top boxes and other audiovisual sources to television sets, projectors and other video displays.
HDMI can carry high quality multi-channel audio data and can carry all standard and high-definition consumer electronics video formats. Content protection technology is available. HDMI can also carry control and status information in both directions.

HDMI is backward compatible with DVI (1.0). Compared with DVI, HDMI offers extra:
- YUV 4:4:4 (3 x 8-bit) or 4:2:2 (up to 2 x 12-bit), where DVI offers only RGB 4:4:4 (3 x 8 bit).
- Digital audio in CD quality (16-bit, 32/44.1/48 kHz), higher quality available (8 channels, 192 kHz).
- Remote control via CEC bus (Consumer Electronics Control): allows user to control all HDMI devices with the TV's remote control and menus.
- Smaller connector (SCART successor).
- Less cables: e.g. from 10 audio/9 video cables to 3 HDMI cables.

9.8.2 Implementation

The IC used is the Sil 9025 (Silicon Image) third generation HDMI receiver, item 7817 on the SSB.

It has the following features:
- Dual HDMI input connector
- Two EEPROMS to support EDID
- HDMI audio
- I²S output to low-cost DACs which operate at a frequency of 32 to 192 kHz
- Integrated HDCP decryption engine
- Built-in pre-programmed HDCP keys for highest level of copy-protection security
- Colour space conversion RGB to YCbCr
- “Hot Plug Reset” signal.

Figure “HDMI implementation” shows the HDMI configuration in this chassis.

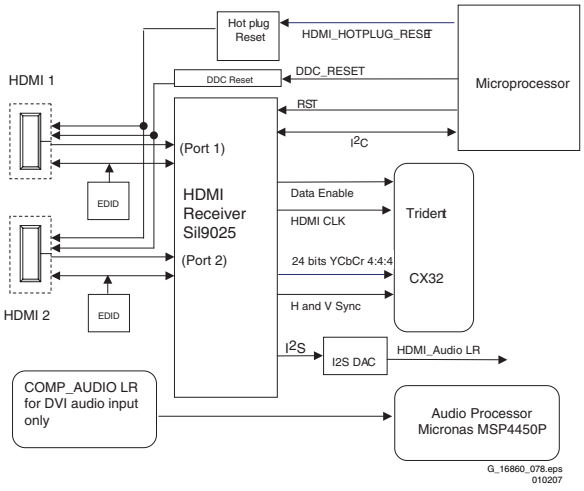


Figure 9-12 HDMI implementation

HDMI connectors 1 and 2 are connected to resp. ports 1 and 2 of the HDMI receiver. The ports cannot be activated at the same moment. Switching is controlled by software.
“Hot Plug Reset” and “DDC Reset” are controlled by the microprocessor.

The HDMI receiver will convert all RGB or YCbCr 4:2:2 signals to 24-bit YCbCr 4:4:4. When it receives a YCbCr 4:4:4 signal it will just pass the signal directly to the Trident Video Processor.

9.9 Abbreviation List

1080i	1080 visible lines, interlaced
1080p	1080 visible lines, progressive scan
2CS	2 Carrier Sound
2DNR	Spatial (2D) Noise Reduction
3DNR	Temporal (3D) Noise Reduction
480i	480 visible lines, interlaced
480p	480 visible lines, progressive scan
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeping up the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
AUO	Acer Unipack Optronics
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASD	Automatic Standard Detection
AV	Audio Video
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BTSC	Broadcast Television System Committee
CAM	Conditional Access Module
CBA	Circuit Board Assembly (or PWB)
CEC	Consumer Electronics Control bus; remote control bus on HDMI connections
CI	Common Interface; E.g PCMCIA slot for a CAM in a set top box
CL	Constant Level: audio output to connect with an external amplifier
CLUT	Colour Look Up Table
ComPair	Computer aided rePair
COFDM	Coded Orthogonal Frequency Division Multiplexing; A multiplexing technique that distributes the data to be transmitted over many carriers
CSM	Customer Service Mode
CVBS	Composite Video Blanking and Synchronisation
CVBS-MON	CVBS monitor signal
CVBS-TER-OUT	CVBS terrestrial out
CVI	Component Video Input
DAC	Digital to analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DDC	Display Data Channel; is a part of the "Plug and Play" feature
DFU	Directions For Use: owner's manual
DNR	Dynamic Noise Reduction
DRAM	Dynamic RAM
DSP	Digital Signal Processing
DST	Dealer Service Tool: special (European) remote control designed for service technicians
DTS	Digital Theatre Sound
DVB(T)	Digital Video Broadcast; An MPEG2 based standard for transmitting digital audio and video. T= Terrestrial
DVD	Digital Versatile Disc
DVI	Digital Visual Interface
DW	Double Window

ED	Enhanced Definition: 480p, 576p
EDID	Extended Display Identification Data (VESA standard)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EU	EUrope
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FBL	Fast Blanking: DC signal accompanying RGB signals
FBL-TXT	Fast Blanking Teletext
FLASH	FLASH memory
FM	Field Memory / Frequency Modulation
FMR	FM Radio
FRC	Frame Rate Converter
FTV	Flat TeleVision
H	H_sync to the module
HD	High Definition: 720p, 1080i, 1080p
HDCP	High-bandwidth Digital Content Protection; A "key" encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a "snow vision" mode or changed to a low resolution. For normal content distribution, the source and the display device must be enabled for HDCP "software key" decoding
HDMI	High Definition Multimedia Interface, digital audio and video interface
HP	Head Phone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I2C	Integrated IC bus
I2S	Integrated IC Sound bus
IBO(Z)	Intelligent Bolt On module. Z= Zapper; module for DVB reception.
IC	Integrated Circuit
IF	Intermediate Frequency
IR	Infra Red
IRQ	Interrupt ReQuest
Last Status	The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according the customers wishes
LATAM	LATin AMerica
LC07	Philips chassis name for LCD TV 2007 project
LCD	Liquid Crystal Display
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LPL	LG Philips LCD
LS	Loud Speaker
LVDS	Low Voltage Differential Signalling, data transmission system for high speed and low EMI communication.
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MOSFET	Metal Oxide Semiconductor Field Effect Transistor
MPEG	Motion Pictures Experts Group
MSP	Multi-standard Sound Processor: ITT sound decoder
MUTE	MUTE Line
NAFTA	North American Free Trade Association: Trade agreement between Canada, USA and Mexico
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, used mainly in Europe.
NTSC	National Television Standard Committee. Colour system used mainly in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non Volatile Memory: IC containing TV related data (for example, options)
O/C	Open Circuit
ON/OFF LED	On/Off control signal for the LED
OAD	Over the Air Download
OSD	On Screen Display
PAL	Phase Alternating Line. Colour system used mainly in Western Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PC	Personal Computer
PCB	Printed Circuit Board (or PWB)
PDP	Plasma Display Panel
PIG	Picture In Graphic
PIP	Picture In Picture
PLL	Phase Locked Loop. Used, for example, in FST tuning systems. The customer can directly provide the desired frequency
PSU	Power Supply Unit
PWB	Printed Wiring Board (or PCB)
RAM	Random Access Memory
RC	Remote Control transmitter
RC5 (6)	Remote Control system 5 (6), the signal from the remote control receiver
RF	Radio Frequency
RGB	Red, Green, and Blue. The primary colour signals for TV. By mixing levels of R, G, and B, all colours (Y/C) are reproduced.
RGBHV	Red, Green, Blue, Horizontal sync, and Vertical sync
ROM	Read Only Memory
SAM	Service Alignment Mode
SC	SandCastle: two-level pulse derived from sync signals
SC1-OUT	SCART output of the MSP audio IC
SC2-OUT	SCART output of the MSP audio IC
S/C	Short Circuit
SCL	Clock signal on I2C bus
SD	Standard Definition: 480i, 576i
SDA	Data signal on I2C bus
SDI	Samsung Display Industry
SDM	Service Default Mode
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Memoire. Colour system used mainly in France and Eastern Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switch Mode Power Supply
SND	SouND
SOPS	Self Oscillating Power Supply
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
SSB	Small Signal Board
STBY	Stand-by
SVHS	Super Video Home System
SW	Sub Woofer / SoftWare
THD	Total Harmonic Distortion
TXT	TeleteXT
uP	Microprocessor

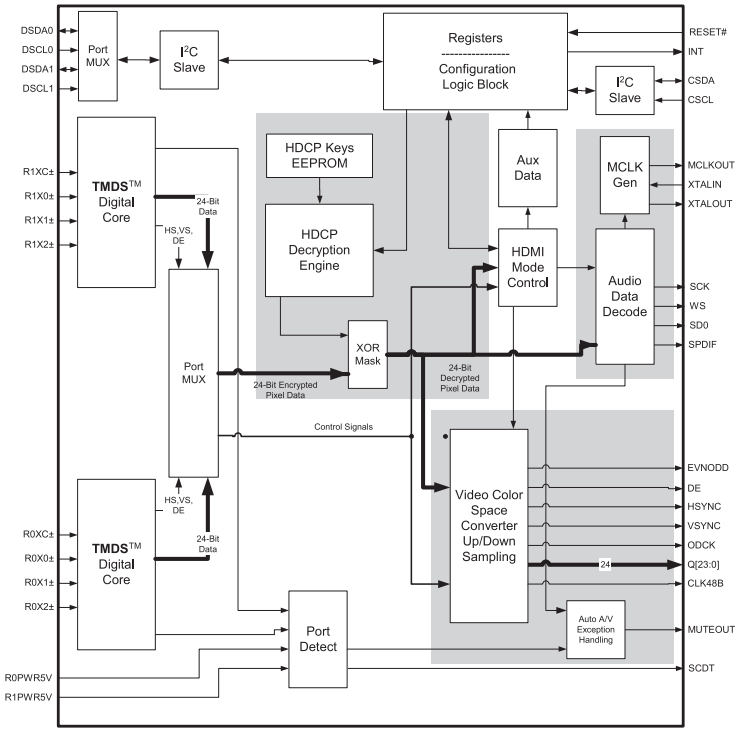
VL	Variable Level out: processed audio output toward external amplifier
VCR	Video Cassette Recorder
VGA	Video Graphics Array
WD	Watch Dog
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
XTAL	Quartz crystal
YPbPr	Component video (Y= Luminance, Pb/Pr= Colour difference signals B-Y and R-Y, other amplitudes w.r.t. to YUV)
Y/C	Video related signals: Y consists of luminance signal, blanking level and sync; C consists of colour signal.
Y-OUT	Luminance-signal
YUV	Baseband component video (Y= Luminance, U/V= Colour difference signals)

9.10 IC Data Sheets

This section shows the internal block diagrams and pin layouts of ICs that are drawn as "black boxes" in the electrical diagrams (with the exception of "memory" and "logic" ICs).

9.10.1 Diagram B06C, Type SIL9025CTU(IC7817) (HDMI)

Block Diagram



Pin Configuration

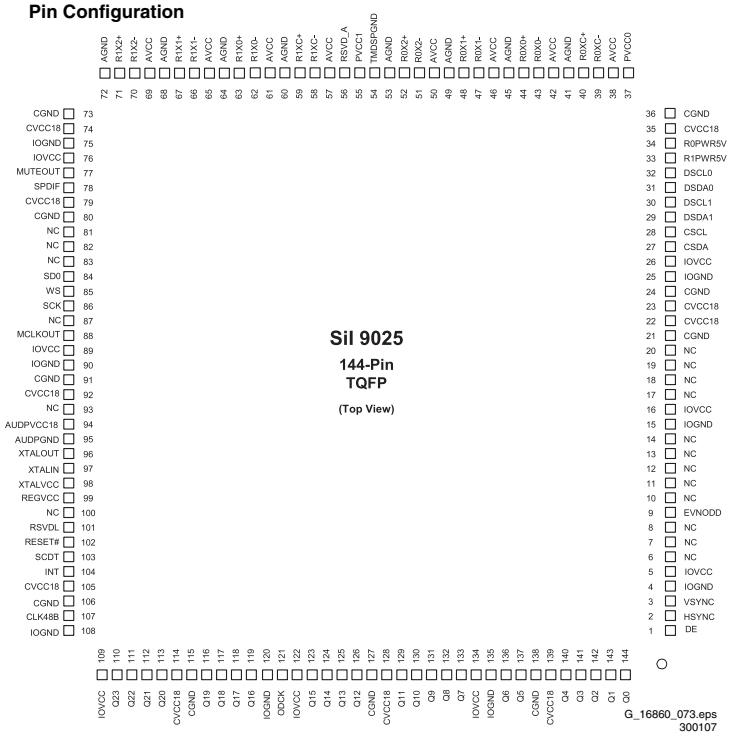
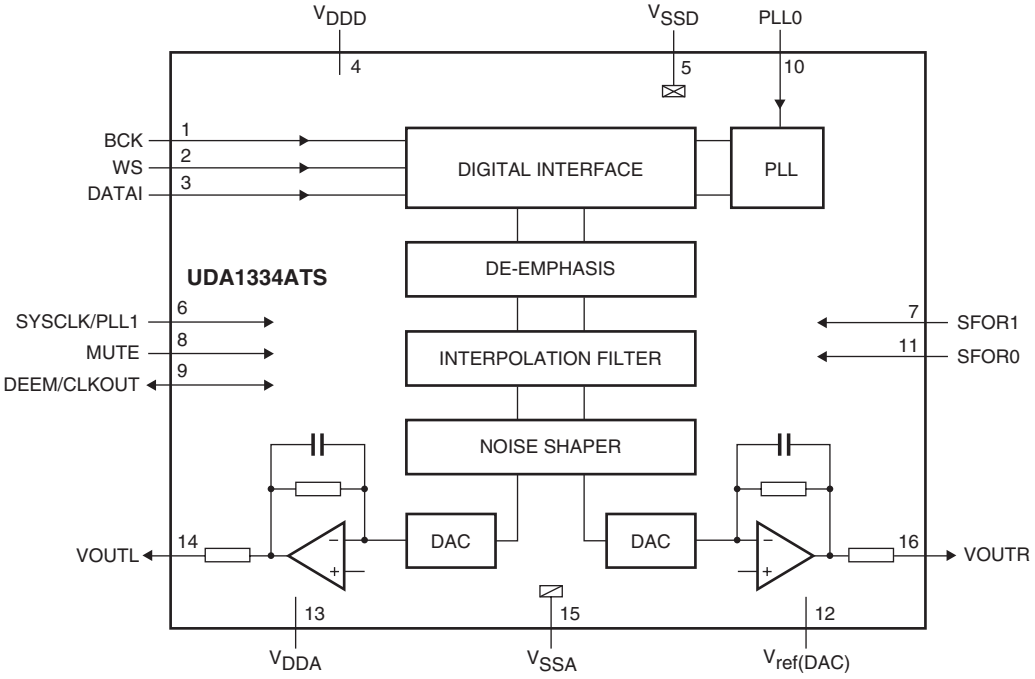


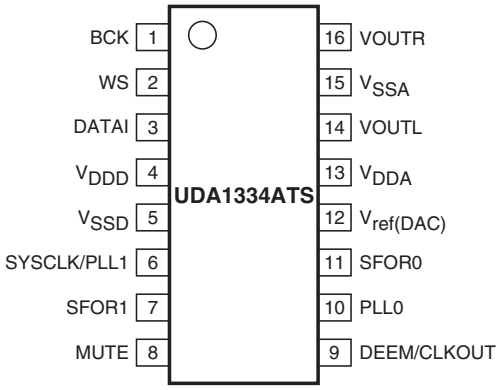
Figure 9-13 Internal block diagram and pin configuration

9.10.2 Diagram B06C, Type UDA1334ATS (IC7810) (audio DAC)

Block Diagram



Pin Configuration



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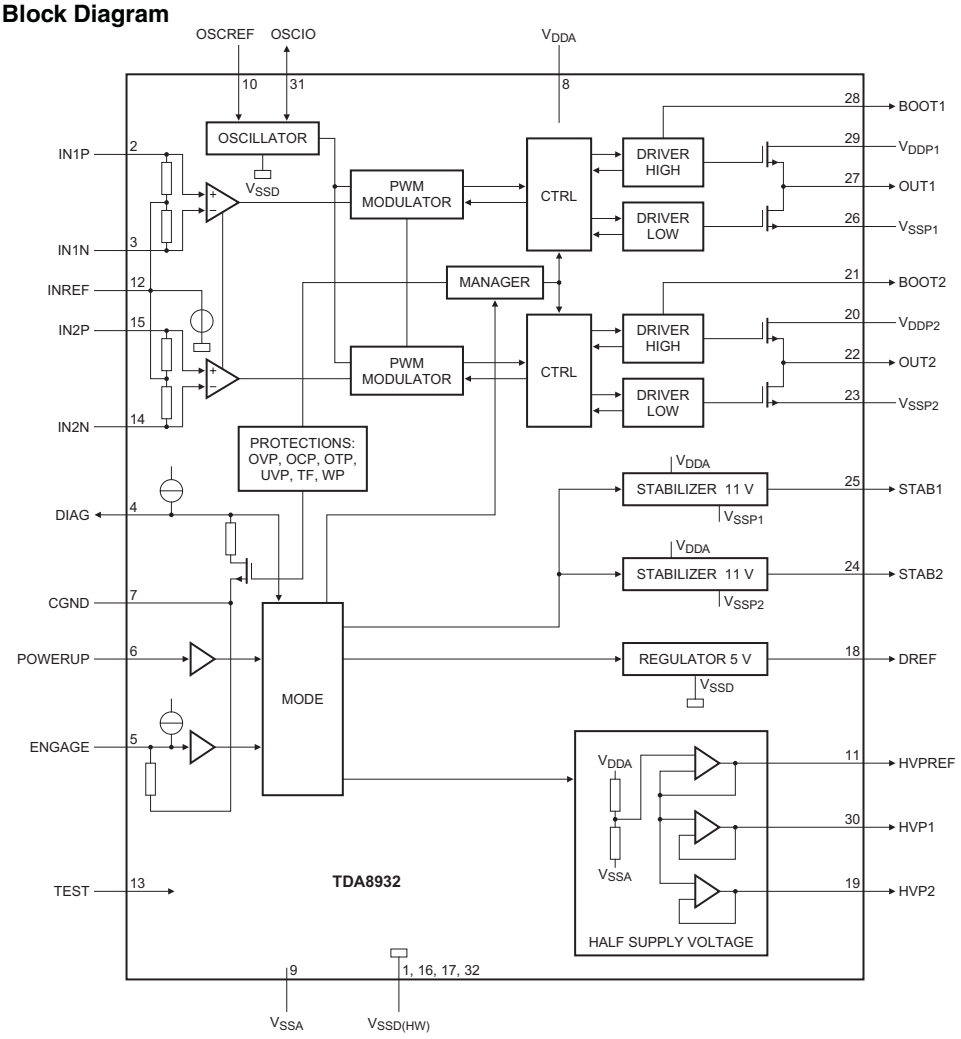
220207

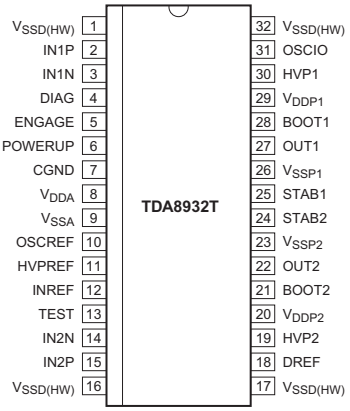
Figure 9-14 Internal block diagram and pin configuration

9.10.3 Diagram B07, Type TDA8932T (IC7A01) (audio amplifier)

Block Diagram



Pin Configuration



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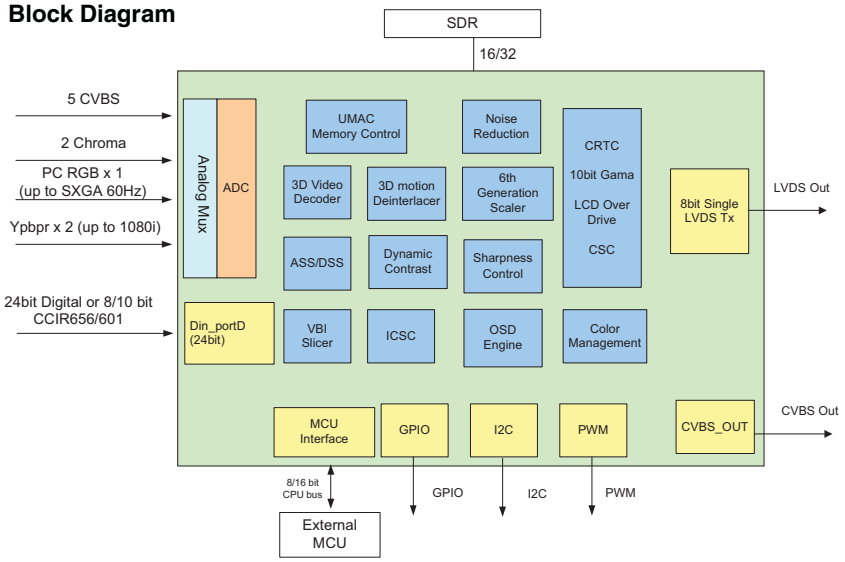
300107

Figure 9-15 Internal block diagram and pin configuration

9.10.4 Diagram B04B, Type SVP CX32 (IC7202) (Trident video processor)

Block Diagram



Pin Configuration

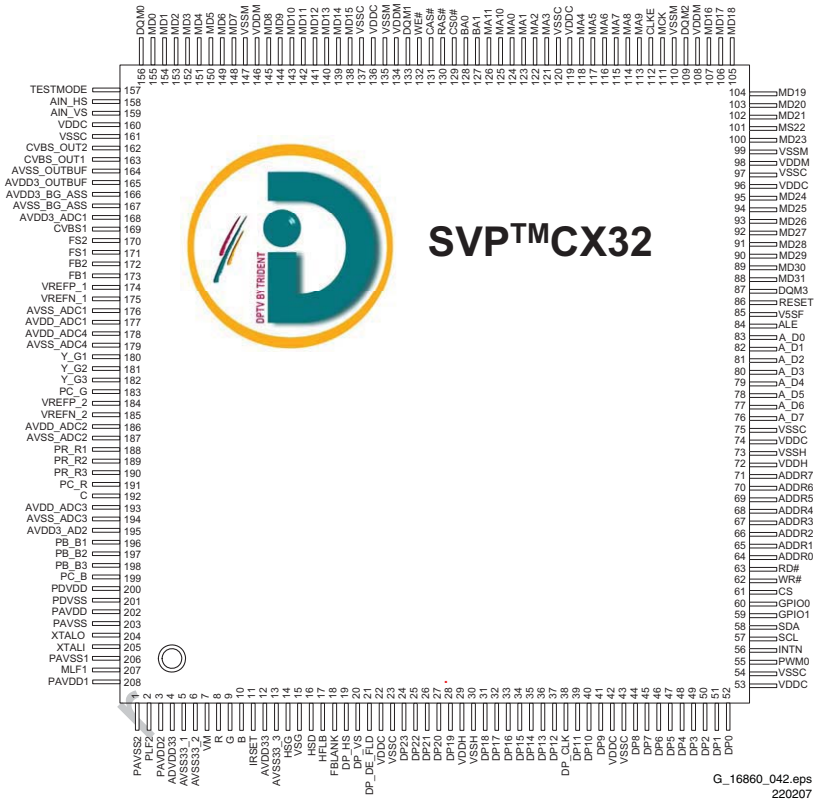


Figure 9-16 Internal block diagram and pin configuration

9.10.5 Diagram B04C, Type MSP4450P (IC7411) (Micronas sound processor)

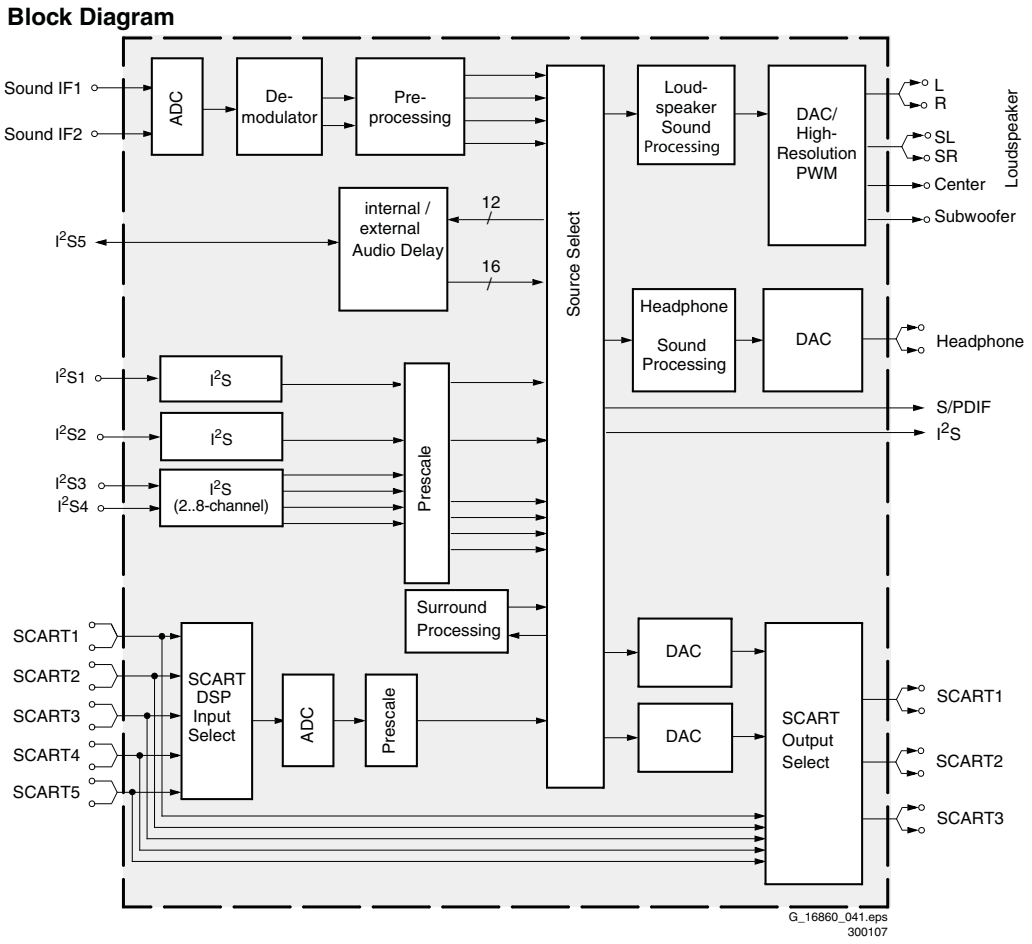


Figure 9-17 Internal block diagram